

## PUBLIC PARTICIPATION IN STA-3/4

Throughout the history of SFWMD's Everglades restoration efforts, every attempt has been made to actively solicit broad-based public review and comment. The original Programmatic Environmental Impact Statement documented the numerous public meeting and independent technical groups that consisted of members from federal, state and local agencies as well as other special concern groups. The commitment to public involvement has continued through the design of STA-3/4.

The District held a public workshop on February 16, 1999 to discuss the Primary Factors for Design of STA-3/4. The STA Design Group has held public meeting in January, February, March, May, July, August, October and December of 1998. The STA Design Group in 1999 held meetings in January, February, May and June of 1999. On March 18, 1999 the District held a Workshop that discussed the possibility of inclusion of any new technologies into the design of STA-3/4. Monthly updates have been given to the Governing Board to present new contracts, milestone completion dates and progress reports for STA-3/4. The District also assured the Governing Board members on April 7, 1999 that the District was awaiting the newly formed Advanced Treatment Technology Task Force to provide direction on the inclusion of any additional systems into STA-3/4. The Task Force met initially on April 27, 1999 and was followed by two meeting in May and one meeting in June. The Task Force at this time has been discontinued, but may reconvene as the need arises.

The District will continue to hold public meeting and workshops. The District has in place a Web Board located at [sfwmd.gov](http://sfwmd.gov) under the heading Major Projects, ECP STA-3/4 Design Review WebBoard. This WebBoard will post all STA-3/4 deliverables for review public comment. The District will also hold traditional workshops to receive comments during the 404 permit modification process.

STA DESIGN GROUP  
MEETING HIGHLIGHTS  
JANUARY 13, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Tony Federico, MFL
Bob Kadlec, representing DOI	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Gene Duncan, Miccosukee Tribe
Blake Sasse, GFC	Gerald Benock, Seminole Tribe
Tom Kosier, SFWMD	John Marshall, ARML NW Refuge
Don Nuelle, SFWMD	Tom McKernan, SFWMD
Jennifer Jorge, SFWMD	Kevin Aubrey, Dames & Moore
Fred Rapach, PBCWUD	Pete Rosendahl, Flo-Sun
Joan Lawrence, SFWMD	Mariano Guardo, SFWMD
Max Day, SFWMD	Victor Powell, SFWMD
Pete Rosendahl, Flo-Sun	Rich Virgil, SFWMD
Craig Tepper, Seminole Tribe	Frank Jones, USSC
Andre Cadogan, SFWMD	Ed Brown, ACOE

Handouts: Agenda, 1/7/98 e-mail from Paul Moczynski (ACOE), a 1/12/98 letter from Kathy Keys (DEP) regarding Rotenberger land, and the 1/2/98 Weekly Reports.

1) UPDATE ON STA Construction.

STAs 1W, 2 and 5: Construction started on November 24, 1997, for STA 1W, and has a duration of 480 calendar days. January 5, 1998 is the day the Notice to Proceed was effective for STA 2; it has a duration of 511 calendar days. STA 5 started on November 15, 1997 - it has a Contract Time of 410 calendar days. On all three projects, mobilization and early excavation is occurring.

For the STA 1 Inflow & Distribution works, beyond the erroneous boring at structure G-301, no further problems have been reported. There is opportunity to make up time. If not, its delay will not affect startup of STA 1W.

2) UPDATE ON STA 1E.

The e-mail from Paul Moczynski was briefly reviewed. Comments on the draft PCA have been received and are being incorporated and reviewed, and will be sent to higher levels in the Corps. Work continues on the pump stations. Boundary surveys, and surveying for borings for the S-362 Pump Station will happen soon. ACOE is also working with FP&L.

3) UPDATE ON ROTENBERGER INHOLDINGS.

The letter from FDEP was reviewed. The report shows that the Etheridge parcel is likely to be acquired by the end of January (this is the last parcel needed in the area of the STA 5 Discharge Canal). The release from the Game & Fish Commission management lease, and a deed to the District are the next items to be addressed, and then land issues for the Discharge Canal should be completed.

4) OPEN DISCUSSION

- a) Bob Kadlec asked for information on a meeting he heard about recently. The Principals of the Technical Oversight Committee (TOC) have apparently selected a few of the many issues raised at the 9/27/97 meeting to pursue. There are 3 or 4 subjects, including getting water to the Refuge from STA 2 during startup. The District will investigate and provide a briefing.
- b) Tony Federico and Bob asked about the situation with getting seepage water from STA 2 to WCA 2A. Jim Kunard said that there was a feature to perform this function, but it was deleted at the recommendation of the Oversight Team last summer, because it is not in the Conceptual plan, and its cost was about \$600,000. They asked the District to consider less expensive options to do the same thing. Bob said that that this large quantity of fairly good water (20% of the average annual flow) should be considered as an asset to be utilized. Perhaps simple gated culverts would work.
- c) Bob asked about the water monitoring data in the C51 Canal that will support design of STA 1E. Jim reported that the data has not passed QA review, mainly because the UVM has not been fully calibrated. Bob said that should not affect info on Phosphorus, and expressed dismay that the corps did not yet have this data to design the STA. Tony asked for the keys and station IDs so the data can be obtained from the computer when available.
- d) There was an inquiry as to whether or not the FDEP could condemn lands in the Rotenberger Tract. Blake Sasse said he felt they could, even though the funds are from "CARL P2000" accounts. Joe Schweigart said that FDEP can get authority to condemn if they need to.
- e) Bob asked if there was a "disconnect" in the timing between when Phase II technology will be available, and when STA 3 / 4 will be designed and constructed per the EFA. Galen said that this is likely. The District will investigate and report.

- f) Jim asked if there were any general comments on the recent news that the federal government will purchase the Talisman property in the EAA. Gene Duncan said that they are working on a plan. Bob asked who was in charge of the myriad effects of the purchase. Joe Schweigart said that the District is only marginally involved, has little leverage and no control over what happens. It is a federal initiative.

It was noted that some ideas involve land trades, including swapping Talisman land for land further south (for instance, near STA 3 / 4). Tony asked when the solicitation for STA 3 / 4 was to occur - Jennifer Jorge said that scope generation, and an assessment of "lessons learned" for the Request for Proposals (to acquire a consultant) will begin in April - May. She said the solicitation process is a long one, and that a consultant should be under contract before the end of the year. Bob asked if the latest plan for STA 3 / 4 was still the GDM plan, and Jennifer replied that it was.

Pete Rosendahl said that there are ideas to create many small reservoirs, or a few big ones with the land. They could function as another buffer for water heading south, sources of water in dry times, and might ease delivery problems from Lake Okeechobee.

- g) Blake said that there were some issues from fall of '96 that they would still like to see a response to: (a) Operation of the Rotenberger Tract - how will decisions be made? (b) Construction of STA 3 / 4 will require changes in the operation of the Holey Land.

He noted that, with the new awareness of seepage, it might be that the pump stations are not enough to establish control over Holey Land water levels. The District said that would be a good scope item for the STA design. Blake said that this issue is also being addressed in the Restudy - but he prefers that it be addressed by the District in design, because it will be faster.

- h) Gene Duncan said that they are getting funds from the federal government for enhancing water quality on the reservation. He asked if the District would provide information on the solicitation for STA design services. Jennifer will supply the original RFP and the detail scope of the main contracts.
- i) Bob would like to have an update on the L8 Canal plans at the next meeting.
- j) Fred Rapach asked what the compliance test will be for STA 1W, since it will operate in an overload mode for several years after completion. It will receive L8 loads until that area is addressed.

k) The next meeting was tentatively scheduled for February 26.

Suggested Topics for next meeting;

1. Provide a briefing on TOC Principals "workaround" issues.
2. Find out what the Corps has decided regarding Phase II technology for STA 1E.
3. Timing of STA 3 / 4 with respect to the Restudy, Talisman purchase and availability of Phase II technology.
4. Get an update from Planning on N.P.B. Comprehensive Plan / L-8 issues.
5. When will Rotenberger and Holey Land Operational Plans be developed?
6. What will the compliance test be for STA 1W, considering that it will receive loads above design for a few years.

C: STA mailing list  
File

STA DESIGN GROUP  
MEETING HIGHLIGHTS  
FEBRUARY 25, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Tony Federico, MFL
Bob Kadlec, repr. USDO	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Thomas Corcoran, Nat'l Audubon
Blake Sasse, GFC	Sherry Scott, SFWMD
Avinash Patwardhan, USEPA	Bill Guerry, Citizen
Joe Guerry, Citizen	Al Rose, Adair & Brady
Jennifer Jorge, SFWMD	Len Wagner, SFWMD
Fred Rapach, PBCWUD	Pete Rosendahl, Flo-Sun
Joan Lawrence, SFWMD	Mariano Guardo, SFWMD
Ana Marshall, SFWMD	Victor Powell, SFWMD
John Bretz, Sverdrup	Rich Virgil, SFWMD
Agnes Ramsey, SFWMD	Spencer Forrest, Brown & Caldwell
Frank Nearhoof, FDEP	Tom Johns, SFWMD
Bob Barron, USACOE	Su Jewell, USFWS
BJ Kattel, GFC	Jim Sturgis, SFWMD
Mike Zimmerman, ENP	Bill Walker, repr. USDO
Angie Dinkla, Burns & McD	Jose Calas, FDEP@SFWMD
Ron Hilton, Burns & McD	Armando deLeon, Burns & McD
Angela Berry, Brown & Caldwell	Linda McCarthy, FDACS@SFWMD

Handouts: Agenda, 1/30/98 memo from Bob Barron to the Technical Oversight Committee Principals on the Work-Arounds, 2/24/98 memo from Brown & Caldwell to the District on S-6 Diversion Works, C51 West Monitoring Program, Calibration Reports, Load Calculations, WQ data and Pesticide WQ data, and Water Quality Data for STA 1E.

- 1) REPORT BY BOB BARRON ON THE ACTIVITY OF THE TECHNICAL OVERSIGHT COMMITTEE PRINCIPALS.
  - A) Bob reported that the "principals" are Sam Poole, Colonel Miller, Dick Ring and Burkett Nealy. From the list of discussion items last September, the principals have focused on four issues:
    1. Vegetation - how can start-up be shortened?
    2. Can water be routed from STA 2 to the Refuge during startup?
    3. Can operation be accelerated using portable pumps?
    4. Can STA 3 / 4 be accelerated?
  - B) The Principals have asked Bob to get input from the STADG on Item (4), more specifically, to "fill in" paragraphs 3 and 4 on page 15 and 16.

The group decided that it would take up this issue. The District will forward the current STA 3 / 4 schedule to the group, as well as put the issue on the next STADG agenda for an in depth review. The STADG invited Bob back to participate at the next meeting.

Pete Rosendahl said that he would be interested in seeing how schedule adjustments affected cost. Bob said that consideration of schedule changes would have to include cost - Pete added that it needed to be a "top of the list" item.

Bob asked that the group think of options beyond the three already listed.

Jim Kunard said that, as far as Phase II technology was concerned, there was a "disjoint" with the STA 3 / 4 schedule: Preceded by planning, design and land acquisition, Construction should start in early 2001, but the date to even set the ultimate standard for phosphorus is not until December of that year.

## 2. S-6 DIVERSION WORKS DESIGN REVIEW.

- A) Spencer Forrest, of Brown & Caldwell (the District's design consultant) reviewed the design history of the S-6 Diversion works. This work is slated to be advertised for bids this summer. In this project, the Hillsboro Canal will be diverted downstream of Pump Station S-6, into STA 2 for treatment. Last summer, the Oversight Team recommended the following changes, that reduced the cost of the effort from \$5-6 million to \$3-3.5 million:
- B) There is a gated structure proposed for installation in the Hillsboro that will allow operators to send water east without passing it through the STA. The size of that structure was proposed to be reduced in capacity to 970 cfs, or the size of one of the S-6 pumps. This would facilitate untreated water supply to the east.
- C) The supplementary canal from the STA 2 discharge canal (which is the L-6 borrow canal) to the Hillsboro (the "WCA 1 water supply canal"), downstream of S-6, was proposed to be eliminated.

Su Jewell expressed concern, but it was explained that this feature was not funded by the Conceptual Design. The District decided to delete it.

Bob Kadlec urged the District to weigh the long term gains in environmental enhancement versus the short term aid to cash flow.

- D) The control structure in the L-6 borrow canal, that would have permitted water to flow either way between the STA 2 supply canal and the

discharge canal, was proposed to be changed to an "armored" overflow weir. This will still permit, in high water conditions, water to be discharged to WCA 2A prior to treatment, but eliminates the ability to bring water from the discharge canal / WCA 2A to the STA supply canal. Bill Walker said that the Restudy, Alternatives 2 and 3, show bypasses in the 10-year period. Fred Rapach noted that the changes reduce operational flexibility. The District is reconsidering this change.

3. BRIEFING ON THE NORTHERN PALM BEACH COUNTY  
COMPREHENSIVE WATER MANAGEMENT PLAN, AND SOUTHERN L-8  
BASIN.

- A) Len Wagner of the District's Planning Department briefed the STADG on the Plan, which includes southern L-8. She said that the L-8 canal is the western boundary of the study. The Plan is a joint effort between the District, the City of West Palm Beach, and the County. The Plan includes the 20 square mile Water Catchment Area, which is covered by Class I water quality standards.
- B) Len reported that Phase 1 of the Plan, model development, is complete, and includes the Southern L-8 basin (which is not covered by ECP efforts). Phase 2 is development of strategies and alternatives, and is scheduled for completion by the end of 1998.
- C) Conceptually, it is intended for Southern L-8 water to be directed mostly to the north. Improvements to M Canal are possible (it leads to the Catchment Area). Some storm events would still send water south. Excess flows would be sent to tide. The S-316 divide structure (an ECP feature) in the Northern L-8 is included in the study. It would direct Dupuis and Corbett runoff to the lake. Tony Federico asked about the timing of that facility. Jim Sturgis said that it is slated for construction in 2003.
- D) Len said that they are also investigating Aquifer Storage and Recovery systems.

4. C51 WATER QUALITY DATA / MONITORING UPDATE

- A) Jim Sturgis reported that the C51 West basin is 71 square miles +/- . As reported previously, the District has been monitoring water quality and quantity in support of the Corps' project for C51 West and STA 1E. The station just west of SR 7 is on line, but the District is still having trouble with the one at S-5AE. Tony asked if the UVM is driving the sampler, and Jim said it was (after a certain volume of water has passed the station, the sampler is directed to operate).



Jim reported that water does flow west, approximately 3 days per 100, but only in small volumes. At SR 7, no westward flows were recorded. Preliminary quality reports indicate concentrations of about 60 +/- ppb phosphorus in southern L-8, versus 143 +/- ppb in C51 West. Pete Rosendahl noted that there might be pump stations in tributaries, at which flow or quality records might exist, but Galen Miller said that Acme and others have gravity connections, at which no records exist.

Su asked if the data had been sent to Paul Moczynski - Jim Sturgis reported that it had.

Tony asked for the database keys - Jim said they were: Station Codes: C51S5AE / C51SR7, project ID: STA 1E.

## 5. STA CONSTRUCTION UPDATE

- A) Victor Powell reported that the STA 1 Inflow & Distribution works was back on schedule. On STA 1W, the contractor has stepped up the pace and is on schedule. Su asked if use of ENR was to be disrupted - Joe Schweigart said that the District made a commitment not to do that, but there might be some reductions in flow.
- B) STA 2 is underway, with significant work done on the levee test section. Still on schedule so far.
- C) On STA 5, less disking and grading is evident, and the muck depths encountered have allowed some reduction in keyway construction under the levees.
- D) The G-310 / G-335 Outflow pump stations have been out for bids since 2/6/98. A 4/1 bid date is anticipated. The compressed 20 month construction schedule will cost approximately \$2.4 million more than a 24 month schedule, so temporary pumping is to be used to accommodate STA startup. The temporary pumping will offset the savings somewhat from changing the construction duration to 24 months.

## 6. FUTURE AGENDA ITEMS / NEXT MEETING

- A) Agenda items: Seepage and its return or discharge from STAs, Info on Restudy (Bill Walker said you can view Alternatives 2 and 3 on his website: <http://www.shore.net/~wwwwalker/restudy>,
  - B) Tentative date for next meeting: 3/31, 10 am.
- C: STA mailing list  
File

STA DESIGN GROUP  
MEETING HIGHLIGHTS  
MARCH 31, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Douglas O'Laughlin, Adair & Brady
Bob Kadlec, repr. USDOJ	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Thomas Corcoran, Nat'l Audubon
Bruce Arrington, Lox NWR	Mark Howell, USSC
Avinash Patwardhan, USEPA	Bill Guerry, Citizen
Joe Guerry, Citizen	Gary Goforth, SFWMD
Jennifer Jorge, SFWMD	Mike Chimney, SFWMD
Dave Stewart, Hutcheon Engrs.	Tom Kosier, SFWMD
Andre Cadogan, SFWMD	Mariano Guardo, SFWMD
Ana Marshall, SFWMD	Rich Meeker, SFWMD
John Bretz, Sverdrup	Mary Ann Poole, GFC
Spencer Forrest, Brown & Caldwell	Ron Hilton, Burns & McD
Tom Johns, SFWMD	Jose Calas, FDEP@SFWMD
Bob Barron, USACOE	Su Jewell, USFWS
BJ Kattel, GFC	Jim Sturgis, SFWMD
Mike Zimmerman, ENP	Angie Dinkla, Burns & McD
Dan Shalloway, SFRN	Tom MacVicar, MFL

Handouts: Agenda, STA 1E Construction Schedule, 2/28/98 Letter/report from Bob Kadlec "Leaky Treatment Systems, Recycle and Discharge" (14 pages), and slides of the same title (11 pages), STA 3 / 4 "Proposed Schedule" (one colorized sheet), and page 2 of 2 of Bob Barron's TOC Workaround report.

1) *STA UPDATES*

**A) STA 1E** (via phone with Paul Moczynski, ACOE): On March 3rd and 4th the ACOE was here for a tour of STA 1W and the Inflow & Distribution Works. Their intent was to problem-share and pick up lessons learned. Drs. Gray and Aumen briefed them on the Supplemental Technology Program.

The PCA was forwarded 'up the line' on March 26. The Design Memorandum is undergoing a revision. A meeting is planned for 4/6 with the pump station designers. The machinery contract is at the 50% plan / spec stage. They will be visiting the pump stations here. They will also meet with FP&L regarding the transmission lines relocation cost, design and schedule.

The field investigations are underway, but due to a real estate issue, the borings under S-319 are being held up. This will affect the schedule, and the ACOE is looking at how that time could be made up. Phase I Audits are underway.

ACOE has seepage concerns - that issue is tied to the soil borings.

ACOE is working on a PSTA for STA 1E, they are developing the scope in conjunction with Drs. Gray and Aumen, and are working up an estimate.

ACOE intends to come to the July STADG for a plan review/discussion; they will try to send sketches in advance.

Dan Shalloway asked about the construction schedule, especially timing of the C51 water control structures. Paul reported that sequencing is in review. Jim Sturgis handed out the ACOE's schedule.

Mike Zimmerman asked if it was decided yet which party would be responsible for water quality - Paul said no.

Paul stayed on the line to hear Bob Kadlec's presentation.

**B) STA 1W:** Jim Kunard reported that the contractor has demucked 4 miles of seepage canal and has started work on the north perimeter levee. They are almost done with demucking of the inflow and spreader canals. They are clearing the north 2 miles of the discharge canal. Culverts for G-304 and G-305 are being delivered shortly.

**C) STA 1 Inflow & Distribution Works:** Jim said that the roller gates for G-301 are now hung, the NE wingwall is in place and riprapping is underway. Water is now flowing through this structure in anticipation of the levee tie-in to the east. Structure G-302 is well underway - work is currently on the south abutment wall and pier. Two Change Orders are being contemplated - they may have a net price decrease.

**D) STA 2.** G-332 and G-334 have been excavated and are awaiting their grout curtains. The test levees are nearly complete. Interior levees 1 and 2 are demucked. Dewatering is being directed to Cell 1, which should assist startup.

**E) STA 5.** Tom Johns reported that construction is proceeding on schedule. All four seepage / water supply pump stations are underway.

**F) STA 6.** Pumping into the STA has stopped due to low recent rainfall. Rates have been about 50 ppb going in, and 20 ppb coming out.

2) *STA SEEPAGE (Bob Kadlec) See the handouts*

a) Bob gave a presentation on the leakiness of STAs and the whether or not it is advisable to recirculate seepage waters back to an STA. He used ENR as an example. Bob reported that 20% of the ENR water is recirculated seepage,

weighing in at about 20 ppb phosphorus. Bob referred to Figure E, Recycle, Uniform Leakage, Soil Treatment (in his handout), and page 14 in the "letter" under Table 2, Leak Fraction 0.2 (20%). The seepage water is undergoing treatment in its passage through the soil and also its exposure to limerock. It is uncertain how long such treatment will last. Bob pointed out that soil conditions will probably promote large seepage in both STA 3/ 4 and STA 1E.

Paul Moczynski said that the seepage pump capacity at STA 1E was based on a seepage rate of 300 cfs (higher than the Conceptual Design) plus 172 cfs for "average minimum flows", adding up to 472, and then rounded up to 500 cfs.

b) Bob explained that adding low load water to high load water, (effectively diluting it) reduces the STAs efficiency, and may result in higher concentrations in the discharge. He recommended building in flexibility in the designs. Long term - we can expect no treatment, and we should be prepared to have facilities in place to recirculate, but for some shorter term, direct discharge may be better.

c) STA 1E was discussed. It would qualify as a "front-end leak" due to the distribution cell contemplated next to the C51 Canal. It may leak back to the C51, only to be brought back in by the pump station.

Rich Virgil suggested that some thought be given to a grout curtain along the C51 at STA 1E - if it is economically feasible. Paul cautioned that the frontage of the distribution cell is 4 miles long, next to C51.

d) Bob said there may be other benefits that can be associated with not returning the seepage - such as slowing down the STA flows for longer exposure to plant life. He said that returning seepage always comes with at least some penalty. He recommended a cost/benefit analysis for STAs 1E and 3 / 4, and consideration during operation of STAs 1W and 2, as well as preparing for possible future expenditures should seepage water quality changes become evident.

e) Dan Shalloway said that at least some of the seepage will re-emerge somewhere. Bob said that will depend on the site. Rich Virgil said that the seepage could perhaps be displacing clean ground water, and dispersing vertically - possibly making the effect a long term one.

f) Galen Miller agreed that there is a probability that the phenomenon removing the phosphorus from seepage will "wear out".

Fred Rapach said that, over the life cycle of the STA, if no consideration is made to this expected change in seepage water quality, we could be suddenly faced with a difficult water quality situation and environmental concern.

g) It was also noted that recirculating would be better than allowing an STA to dry out.

3) *STA 3 / 4 TOC PRINCIPALS WORKAROUND*

- a) Bob Barron noted that STA 3 / 4 is not covered under the current 404 permit.
- b) Bob noted that the "currency" we are considering for the STA is tons of phosphorus and time. The schedule shows that Supplemental Technologies are not likely to be timely for consideration in the design of STA 3 / 4.
- c) Tom MacVicar said that there is a need to justify the removal of the Toe of the Boot, and that the resulting land acquisition to the north of the STA is limited to 1 mile from the Conceptual boundary. Gary Goforth said that an environmental assessment would be prepared during the detail design of STA 3 / 4 to document if the Toe of the Boot is a justifiable change, and that equal or greater hydrologic and hydraulic benefits will occur.
- d) Gary said that there are numerous factors that will affect the design to various degrees, all of which need to be considered during the detail design of STA 3 / 4:
  - i) C&SF Restudy, which considers 2 large reservoirs totaling 60,000 acres. Timing of a decision is uncertain, although it is unlikely that the reservoir would be in place prior to 2010.
  - ii) The Lower East Coast Water Supply Plan, for which demand on Lake Okeechobee is different than in the 1994 Conceptual Design.
  - iii) The upcoming federal Talisman property purchase, for which land exchanges are a possibility.
  - iv) We are still about 2 years away from a determination on supplemental technologies.
  - v) Retaining flexibility in the STA design so that Supplemental Technologies could be incorporated if feasible.
  - vi) The ultimate phosphorus criteria have not been set.
  - vii) Construction should actually be underway when Supplemental technologies are determined.
  - viii) BMPs in the EAA may reduce phosphorus loads more than was assumed in 1994.
  - ix) The peer-reviewed Interim Report summarizing EFA research is due on 1/1/99. This was a point where the legislature reserved the right to make a "mid course correction".
- e) Tom MacVicar added that the regulation schedule for Lake Okeechobee may change as soon as 9/98.
- f) Bob Kadlec asked if it was the District's intention to reconsider the STA 3 / 4 footprint. Considering Talisman, it is not clear what will happen. The decision point is probably early next year.

g) Gary noted that there may be a 9-12 month startup period like the other STAs.

h) Bob Barron asked what scenarios we could come up with to go faster on startup? He listed a few:

- i) Land management is one way; if land is purchased, is there any way to flood it? Gary said we can also take care to recognize existing vegetation in the design and construction.
- ii) Consider parallel flowways to offer flexibility to phase 2 efforts.
- iii) Perhaps building one cell at a time would help. Jennifer Jorge said that could work, but to remember that starting and stopping construction to consider new technologies would drive up costs like mobilization and demobilization.

Bob said that the Principals are looking for a broad perspective on options, and would appreciate any brainstorming thoughts.

- 4) *GENERAL DISCUSSION.* Jennifer said the District would try to send out the draft scope prior to the next STADG. Joe Schweigart said that we want to consider all lessons we learned from the past design processes. We need to start brainstorming.

The next STADG was tentatively set for 5/12, at 10:00 am.

C: File (w/att)  
STADG list

MtgSTADG398

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS  
MAY 27, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Jerry Phillips, Sverdrup
Bob Kadlec, repr. USDOJ	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Don Nuelle, SFWMD
Sherry Scott, SFWMD	Steve Coughlin, GFC
Joe Guerry, Citizen	Blake Sasse, GFC
Jennifer Jorge, SFWMD	Grethe McLaughlin, Metcalf & Eddy
Dave Stewart, Hutcheon Engrs.	Charles Geer, Kimley-Horn
Andre Cadogan, SFWMD	Mariano Guardo, SFWMD
Ana Marshall, SFWMD	Rich Virgil, SFWMD
John Bretz, Sverdrup	Fred Rapach, PBCWUD
Dan Clark, Brown & Caldwell	Cheri Scesny, SFWMD
Tom Johns, SFWMD	Tim Sharp, CH2MHill
Bob Barron, USACOE	Su Jewell, USFWS
Jim Sturgis, SFWMD	Mike Zimmerman, ENP
Angie Dinkla, Burns & McD	

Handouts: Agenda, Highlights of Draft Statement of Work (the "SOW" for STA 3 / 4), Technical Oversight Committee (TOC) Principals 5/27/98 "workaround" document, 5/26/98 Conflict of Interest Memo.

1) **Conflict of Interest.** The District desires all firms to be eligible for competition for the design of STA 3 / 4. Joe Schweigart distributed a memo on Conflict of Interest, which addresses the need for competing firms to consider this possibility.

2) **STA 3 / 4 Development.**

**A) Video.** A video was shown of a 5/20/98 flight over the proposed area of STA 3 / 4. Also shown were the Deerfence Bridge construction site, STA 5 inflow structures and the ENR test cells. The vegetation was generally described as:

Okeelanta areas: Sugar cane

Griffin: Rock Mine, Nursery and farm.

Multi turf: Wax myrtle and St. Augustine grass

Carroll (Tarrytown): Disturbed wetland, native and exotic species

Species identified so far: cattail, willow, sawgrass, torpedo grass, wax myrtle, napier grass, dog fennel, sugarcane, St. Augustine grass. A vegetation map will have to be generated during the design stage.

**B) Land Acquisition Data and constraints.** (See map in the SOW highlights handout; "O" = Okeelanta, "G" = Griffin Bros, "M" = Multiturf, "C" = Carroll or Terrytown.)

**GRIFFIN BROS.:**

- 2 Sections.
- Will purchase the nursery inventory and sod crop; this needs to be recovered thru a lease and inventory sale. 200 Ac tree farm. Need to harvest sod as long as possible. Need to give the District's Land Management group as much advance notice as possible as to when sod/nursery activity must cease, because of lead-time investments in fertilizing and farm management.

Bob Kadlec asked how this would affect muck depths. Jim Kunard said that our land managers feel that, if done properly, a loss of 1/2" to 3/4 " per harvest is all the loss. Mr. Guerry confirmed that, and said that what is mostly harvested is the root zone.

- The discharge pump on the property is to be purchased, too (south end - discharges south).
- There is a 190' wide Florida Power & Light (FPL) transmission easement on the south property line. Tower foundation inundation and wire clearances over water and levees are a significant concern.
- Poaching and vandalism can be expected if the site is left unattended.
- Farm manager needed soon after vacation to preserve crop, followed by procurement of a leaseholder.
- North end gets wet from seepage off of the Multiturf property, if the Multiturf pump is cut off.
- District will probably take possession 6/1 (via Order of Taking).
- 150 Ac lake 30-50' deep at rock quarry. Rock can continue to be mined under some circumstances - will need to obtain an outside party to mine.
- Need to get lowdown on existing permits here and all around. May need to re-permit.
- Valuation hearings won't be complete for 9 months.
- Owner is trying to sell mining equipment (draglines, rock crusher).
- District needs to go on site asap after 6/1 to start Phase I Audit. Will check with Palm Beach County's Environmental Resources Management Department (ERM).
- Watch adjacent drainage if going to try to flood / start up!
- Rock survey, soil info are in appraisals.
- Don Nuelle said the District should consider alternative crops as well.

**OKEELANTA**

- 2 Parcels, all sugarcane. South parcel is 4 sections, north is about 6 sections.
- Included in discussions on Talisman trades.
- No action started to acquire this parcel at all, yet.
- There may be a pesticide problem at an airstrip in the north parcel.



- North parcel boundary may change, 600' further north above "The Toe", it would likewise change some number of feet to the south in the eastern end to make up difference in area.

#### MULTI-TURF

- District-Owned for about 5 years. Fertilizer and muck stripping feared - so no lease.
- Muck is thin? Avg. 14"? Bob Kadlec said there is data around that suggests muck depths down to 9". District will research.
- A Periphyton STA (PSTA) project is to occupy the southeast portion. The Multiturf pump station is at the east end of the property as well. It seems to affect ditch water levels for Multiturf, Griffin and the south Okeelanta parcel.
- Hazmat remediation is underway, in a 125 Ac. parcel, near PSTA site, just off us 27. There is about 6 months of cleanup to go.
- Tire dumping along US27 has been reported.

#### TERRYTOWN (AKA "Carroll")

- There is a Memorandum of Understanding in place (MOA) with the Game & Fish Commission (GFC). Blake Sasse said it was for small game hunting. It can be ended whenever the land is needed.
- 4+ Sections (about 3000 acres), disturbed wetland.
- There is a 190' wide FPL transmission easement on the south property line. Tower foundation inundation and wire clearances over water and levees are a significant concern.

#### C) **Design Uncertainties and RFP Statement of Work (SOW) Review / Discussion**

The outstanding uncertainties are listed in the handout, along with paragraph references to the SOW.

The following comments were received:

- i) Tony Federico said that those items, for which the District has the lead, should be put on the detailed project schedule.
- ii) Subtasks 1.1, 1.2 and Paragraph I.A - the word "validation" seems inappropriate - "revisit" (with lessons learned since the General Design Memorandum, or GDM) would be better.
- iii) Subtask 1.2 - Amplify on "brainstorming". What will this entail, who will be involved? Formal meetings are preferred. Bob said he would like to participate in the more important decisions (i.e. seepage with respect to water and phosphorus budget, settlement rate, cell sizing, etc.)
- iv) Bob Kadlec said that there would need to be a clear understanding of where the STA will discharge, as there was great disagreement during the GDM.

- v) What auxiliary pumps are there (Subtask 1.7)? Galen said that there might be a need for supplementary capacity at PS S-7. Also, temporary pumps may be warranted for startup.
- vi) On nutrient removal, Bob said that there needs to be a study item for the phosphorus lost to groundwater. What will be the regulation standard? How will it be counted, budgeted and disposed of?
- vii) Will the District reopen the concept of the buffer cell? The Everglades Nutrient Removal Project (ENR) buffer cell is being merged into Cell 5. Does it really remove suspended matter well?
- viii) It may be a mistake to reopen the Settlement Agreement targets.
- ix) Blake said that seepage of questionable quality into the Holey Land is a concern in terms of phosphorus loads.
- x) Accelerating the schedule may increase cost; budget must be considered in schedule alterations.
- xi) Subtask 1.5.3. Bob said that additional clarity would be useful: Why, and how far, do we need vegetation survey into Water Conservation Area 3A (WCA 3A)?
- xii) Subtask 1.6.1. Where are there undisturbed forests and wetlands in the proposed area?
- xiii) Subtask 1.6.1. Blake said that the toe of the Boot was contained in a levee system constructed by the Florida Department of Transportation (FDOT) as environmental mitigation for developing I-75. Any adjustment must consider previous commitments and understandings related to the mitigation.
- xiv) Subtask 1.6.1. Bob said that this STA is very likely to be significantly leaky, due to the presence of rock and probable significant blasting. Interior borings seem to be justified to help with the determination of water and phosphorus budgets (shallow surface water hydrology).
- xv) Existing and historic water tables should be investigated and documented, to determine the effects of seepage. This is something the District should think about doing in advance of a design consultant.
- xvi) Subtask 1.7. Bob Kadlec disagreed that we should only consider a 2-D model - he feels that vertical and horizontal soil-related losses need to be considered.
- xvii) Tony asked why we would consider separating lake and Everglades Agricultural Area (EAA) runoffs for treatment. The answer is that the overall footprint would be less (hence a cost reduction) if we could separate them (due to less STA efficiency at lower phosphorus concentrations). Tony expressed doubt that the two sources could be kept separate.
- xviii) Dryout analyses should benefit from the STA 6 dryout event.

Bob Kadlec asked why we needed to wait until spring of 1999 to review design premises, incorporate lessons learned and brainstorm design? Jim Kunard said that the procurement process for professional services will take about 5 months -

putting us in that time frame. Anything we identify that we can do before that will be looked into.

Jim Sturgis said that the SOW is a dynamic process, and the final scope will also depend on the cost aspect of negotiations, and budgetary constraints.

#### **D) TOC Principals Workaround.**

Bob Barron provided his latest revisions to the STA- 3 / 4 Schedule issue, dated 5/27/98. He said that he has gotten some good input from the STADG in terms of outstanding factors that will affect design and schedule, which is now reflected in paragraph 3.a (3). Bob's perspective on the SOW is that the language related to early startup in paragraph 1.1 should be amplified. He said that this issue would be a significant item in the Army Corps of Engineer's (ACOE) 404 permit. Options will need to be identified. He said that although the ultimate standard for phosphorus will be either set by the Florida Department of Environmental Protection (FDEP) in 2003 or set by default, the FDEP's staff position could be established as early as 2001. [Author's Note: However, whether or not to proceed at that time is not an easy question.]

NOTE: PLEASE HAVE COMMENTS ON THE DRAFT STATEMENT OF WORK PROVIDED TO JIM KUNARD BY CLOSE OF BUSINESS, **FRIDAY, JUNE 5, 1998.**

#### **E) Schedule of Consultant Procurement**

- |                   |   |
|-------------------|---|
| <b>First Step</b> | <b>6 Weeks:</b> Generate Scope (includes involvement of STADG). Reproduce Conceptual Design (CD) and General Design Memorandum (GDM) for consultants.   |
| <b>2nd Step</b>   | <b>4 Weeks:</b> Advertise the Request For Proposals (RFP), mail cards, Supplier Diversity Office (SDO) review of scope, about 30 days for consultants to get and review documents, District will hold a pre-proposal meeting, consultants will prepare and copy their RFP responses. <i>Anticipated start date is week of 6/22.</i> |
| <b>3rd Step</b>   | <b>3 Weeks:</b> Panel and SDO review submittals, and Shortlist meeting held.  |
| <b>4th Step</b>   | <b>5 Weeks:</b> Shortlisted firms advised, and get about 30 days to prepare for presentations. Final ranking established. Obtain concurrence on ranking and permission to negotiate with top ranked consultant from the Executive Office (EXO).   |
| <b>5th Step</b>   | <b>4 Weeks:</b> Scope refinement and detailed understanding of specific contract requirements, between District and consultant. Consultant submits initial detailed cost proposal.  |
| <b>6th Step</b>   | <b>4 Weeks:</b> Negotiate. If successful, finalize documents, get lined up for a Governing Board meeting.   |

This totals about 26 Weeks, or 6 ½ months. From Step 2, about 5 months.

#### **3) STA UPDATES**

**A) STA 1E.**

Jim Sturgis said that the Project Cooperative Agreement (PCA) may be on the June Governing Board Agenda. The Record of Decision (ROD) has not occurred yet, but this only holds up land acquisition, not design. The ACOE still intends to come to the STADG and present the preliminary designs - probably not at the July meeting - but shortly thereafter. The pump station mechanical procurement specifications are well advanced.

**B) STA 1W:** Victor Powell said that the demucking is nearly complete. The contractor is working on all reaches of the levees. Early work on structure 303 (ENR inflow) has begun. The contractor is slightly behind at this time, but can make it up.

Bob Kadlec asked about the interior of Cell 5. Vic said that the harvest has been done and some of the required disking, also. Two dewatering areas are in place.

**C) STA 1 Inflow & Distribution Works:** Victor said that this project is currently 30 - 60 days ahead of schedule. Structure 301 (in the L-7 borrow canal) is complete except for final mechanical and electrical work. The structural features of Structure 302 (into STA 1W) are about 60% complete. Excavation and dewatering activity has begun for Structure 300 (in the L-40 borrow canal). The separation levee is about 35% complete - the first lift is nearly all the way across the Refuge.

**D) STA 2.** Victor said that there is a lot of rock at this site. Demucking has occurred on Interior Levee 1, Interior Levee 2, and perimeter levees. Foundations to start soon on structures 332 and 334. The contractor is slightly behind but can pick up the time. The seepage pump station G-337 bids are due on Thursday 5/28.

**E) STA 5.** Tom Johns reported that construction is proceeding on schedule. All four seepage / water supply pump stations are underway, below grade concrete is complete. The crops are harvested and the land is disked, and we should be able to start stacking water in the STA by August. The south levee is virtually complete, and work is well advanced on the east levee. The Deerfence bridge is ahead of schedule. Joe Schweigart said that bids on the discharge canal came in today: the low bid was \$3,435,000, from Team Land Development, Inc. \$3.8 million was budgeted. Team Land is a currently a subcontractor on STA 1W.

**F) STA 6.** Andre Cadogan said that Cell 5, 625 acres, is now dry. Cell 3, 245 acres, is minimally wet. Andre said the STA has an efficacy of 60% for the period of December '97 - April '98. See Tim Bechtel for a report.

Bob Kadlec said that we need to learn from this dryout. It can't be irrigated because it would violate the Basis of Design. We may have to bypass, when we shouldn't. He recommended that we make measurements and observations on periphyton and peat. He said Susan Gray was already performing a study, but that its results are important and attention needs to be paid to the event. We may have to retrofit the STA with irrigation facilities if the situation warrants it.

**G) Outflow Pump Stations G-310 and G-335.** The contract for construction of these 2 pump stations was approved at the May Governing Board meeting. The amount of the award was \$31,079,015, to H. Pepper & Associates. The contractor initially tried to avoid taking the award but withdrew its objection.

- 4) Next Meeting:** The next STADG was tentatively set for 7/7, at 8:00 am, right before the Everglades Technical Advisory Committee (ETAC) meeting.

C: File (w/att)  
STADG list

MtgSTADG598

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS  
JULY 7, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Jose Calas, FDEP @ SFWMD
Bob Kadlec, repr. USDOJ	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Robert Martens, SFWMD
Tom Kosier, SFWMD	Tony Federico, MFL
Tom MacVicar, MFL	Blake Sasse, GFC
Jennifer Jorge, SFWMD	Tom Fratz, SFWMD
Dave Stewart, Hutcheon Engrs.	Tom Corcoran, Nat'l Audubon Society
Andre Cadogan, SFWMD	Bill Walker, repr. USDOJ
Alex Perez, SFWMD	Benita Whalen, SFWMD
Susan Gray, SFWMD	Fred Rapach, PBCWUD
Dan Clark, Brown & Caldwell	Peter Besrutschko, USACOE
Tom Johns, SFWMD	Bill Malone, SFWMD
Susan Coughanour, SFWMD	Su Jewell, USFWS
BJ Katel, GFC	Mike Zimmerman, ENP
Angie Dinkla, Burns & McD	Paul Whalen, SFWMD (part-time)

Handouts: Agenda, a copy of Bob Kadlec's 6/10/98 letter, a one-sheet table: "STA 3 / 4 and Related Permits" (8 1/2 x 11), a SFWMD regulatory permit-compilation map (11x17), and a 2 page briefing on a proposed extension of the Ocean Canal improvements. Also, passed around was a June photo looking west at STA 1 I&D / STA 1W at structure G-302.

1) **MEETING HIGHLIGHTS CORRECTION.** Bob Kadlec's 6/10/98 letter addresses corrections to the May 27, 1998 meeting highlights. No further comments were received. The topics were clarification on where/how STA 3 / 4 will discharge, and the concept and risks associated with STAs drying out.

2) **STA UPDATES**

**A) STA 1E.**

Jim Kunard said that the ACOE could not attend today, but that it has been arranged for them to make a formal presentation to the STADG on August 19, 1998. The District will try to have info sent out in advance so that the group can be more prepared for discussion. An afternoon start time was requested.

**B) STA 1W:** Jim said that the project was about 32% complete. The good weather may offer opportunities to gain time. In progress: Inflow canals, levees, and control structures, the FP&L access levee, the north Perimeter levee, and blasting for the Discharge Canal began this week. Several C.O.s are in the works, but there should be a net reduction in project cost.

**C) STA 1 Inflow & Distribution Works:** Victor said that this project is currently about 45 days ahead of schedule. Structure 301 (in the L-7 borrow canal) is complete except for final mechanical and electrical work. Wingwalls for Structure 302 (into STA 1W) are underway. Sheet piling for the cofferdam at Structure 300 (in the L-40 borrow canal) has begun. The separation levee is all the way across the Refuge.

**D) STA 2.** Jim said that the following is in progress: L6 canal, the discharge canal in Cell 1 is 75 % complete (muck, rock and excavation complete, shaping remains), Interior Levee 2 is 2/3 done. On the north side of Cell 1, rock excavation is underway. In Cell 2, the rock excavation on the north side is 3/4 complete. They are blasting the west perimeter levee now. The concrete foundation work at S-332 and S-334 is underway (334 is slightly further along). The South L-6 work is done, and ready for the G-335 pump station contractor to use.

**E) STA 3 / 4.** Jim said that the RFP will be formally available on Thursday 7/9/98. The balance of the consultant selection schedule is: 7/22: Mandatory Pre-proposal Conference, 8/11: responses due, 9/1: Shortlist meeting (9/3 raindate), 9/15: Presentations / final ranking (9/17 raindate), 9/22: Executive Office approval and authorization to negotiate, 11/12: Award contract. Jim said a full time project manager has been hired; his name is Mr. Randy Bushey, P.E.. He will be introduced at the next meeting.

**F) STA 5.** Tom Johns reported that construction is proceeding on schedule, with a possibility of them coming in early. The pump submittal is anticipated soon. The south levees and canals are virtually done. The contractor may be in a position to start wetting the southwest cell in August / early September.

The Discharge Canal was awarded, after a threatened bid protest failed to materialize. The pre-work conference was held just hours after the deadline to file passed. The contractor wants to use less than the contract time of 12 months.

The bridge over the L-3 at Deerfence canal is substantially complete (open to traffic) - on-time. Contract time expires at the end of July.

The Pump Station 404 & 409 / G-357 / L-4 Levee Breach project is out for bids at this time - August Governing Board approval is anticipated.

**G) STA 6.** Susan Gray said that soil cores, with an associated periphyton mat, are being brought in from the STA and are being rehydrated in the lab, looking for phosphorus release using post-ENR water. They are examining mat formation. The scale of the evaluation is small to fit available resources. The District will be monitoring the interior of the STA as it gets reflooded. Bob Kadlec said not to forget the non-periphyton areas, and urged similar evaluation efforts. Susan said that similar cores were being taken in the northern cell.

**H) Outflow Pump Stations G-310 and G-335.** Notice to Proceed is anticipated this month. Field offices are underway, as well as development of the progress schedule, and schedule of values. Coordination with the pump and engine suppliers is ongoing. The contractor will be assembling a concrete batch plant near the site, due to its remoteness and the large amount of concrete needed. The pump model tests are underway in Seattle, and modifications will be made to adjust for the results.

### **3. DISTRICT REGULATORY PERMIT DETAILS ASSOCIATED WITH STA 3 / 4.**

Jim Kunard said that this agenda item, as well as the PSTA update is intended as a continuation of recent information-sharing STADG agenda items. The items will all affect the STA design in some manner, and will help the group stay in tune with design premises, features and nuances as they become evident in design features.

Susan Coughanour, SFWMD (Senior Planner, Regulation Department), discussed the permit-compilation map in the area of STA 3 / 4 (one of the handouts). It shows the type of District permit associated with each parcel of land within the currently proposed "footprint" of the STA. S = Surface Water, W = Water Use, R = Right-of-way permit. For all the permits in this area, the Water Use permits are surface water only (no wells). The designator "50" in the permit number represents Palm Beach County. The Everglades Works of the District (EWOD) permits are broken up into basins, for which the boundaries are shaded. Susan also provided a table with further details on the District permits, which includes structure numbers, pump capacities, facility descriptions, and comments.

The surface water management and water use permits are typically issued for a specific piece of property to the owner of the property. Based on the current northern boundary of the proposed STA and the proposed supply canal right of way, the lands covered by the existing S/W permits and the EWOD basin boundaries would be split. Even if the northern boundary of the STA is changed, either or both of the S/W permits and the EWOD basin boundaries might still be split. Therefore, modifications to some of the existing permits will likely be needed. Owners have reported groundwater effects across property lines due to farm related pumping activities.



As part of the permit modification, an evaluation of how the proposed permit and EWOD boundary changes relate to existing physical features such as roads, ditches and water control structures would need to be conducted.. Mike Zimmerman asked how the District would "make the land owners whole" (avoid any damages related to land acquisition) if operational features are taken. Susan said that this is taken care of in the cost-to-cure analyses associated with appraisals and purchase offers. Susan explained that certain rights are granted with the surface water management, water use, Everglades works of the district and other permits that are issued under Chapter 373, F.S. Consequently, since the District does not have an underlying proprietary interest in the property covered by these permits, as it does with right of way permits, they cannot be revoked in the same way that right of way permits can be. If the STA design requires any of the S/W/EWOD permits to be modified, the effect of the changes on the authorized facilities and activities would need to be reviewed and addressed by the District.

Paul Whalen said that EWOD permits do not authorize anything, their purpose is to develop on-farm Best Management Practices (BMPs), calculate and monitor the amount of phosphorus and other materials in stormwater runoff, and evaluate the resulting data to ascertain tax credits associated with the Everglades Forever Act.

Tom Fratz said that in addition to right-of-way permits and easements, there are older instruments granting land use rights to FP&L that are in the form of written agreements. Jim Kunard said that coordination with FP&L facilities can have significant design affects, that the STADG needs to be aware of. The details of the permits, easements and agreements need to be reviewed. There is an unusually shaped FP&L easement within the Terrytown tract that may be hard to incorporate into an STA cell.

Tom said that most of the right-of-way permits are associated with the connection of private drainage features to District-maintained canals.

Tom MacVicar said that he would like to see operating permits as a future STADG agenda item.

#### **4. UPDATE ON THE PERIPHYTON STORMWATER TREATMENT AREA (PSTA) TEST PROJECT ASSOCIATED WITH STA 3 / 4.**

Susan Gray, SFWMD (Senior Supervising Environmental Scientist, Ecologically Engineered Systems Research Division, Ecosystem Restoration Department), reported on the effort to construct a PSTA within the boundary of STA 3 / 4. Susan showed overheads, and discussed this project. The first phase of this project is estimated to cost approximately \$1,340,000. The first phase will last 18 months and is expected to answer fundamental biological and engineering questions. The work will be conducted primarily in the area of the ENR test cells

and Supplemental Technology research site at the outflow pump station. Information on the interactions with, and the water quality of, surface and ground water at the STA 3 / 4 site will be generated, and used for modeling. The initial design will include several flumes approximately 80' long and 4' wide. A second phase, if justified, is scheduled for 12/99, and would include the construction and operation of eight (8) one-acre cells. Muck will be removed to the limerock surface to prevent competition from other plant types. The second phase has a tentative budget of \$1,440,000. Permits are still needed.

Bill Walker asked who would actually do the work - Susan said that CH<sub>2</sub>MHill would construct it. Brown & Caldwell is one of their subconsultants.

Susan said that at the selected site, there is 2-3' of muck. Some muck may be left to assess the affect of macrophyte (large leafy plants) on PSTA effectiveness. Although there is some similarity with Cell 4, ENR, where the muck is 3-4' deep, in PSTAs, water needs to be held to 2' deep or less, and the water retention time is much shorter.

Bill Walker asked if macrophytes will be a problem, considering that the test is only to run 18 months after construction. Susan said that based on preliminary field work in the area of STA 3 / 4, she does expect quick growth.

Tony Federico asked about harvesting. Will the macrophytes climax and need harvesting in this time frame? Susan said that macrophytes will grow quickly, and we should get a good indication of what our long-term maintenance costs will be.

Tony asked if velocity of flow mattered? Susan said it does, and that the experimental design will address the expected flows based on ENR flows.

Bill Walker asked if the Susan was coordinating with the C-111 effort. She said she was and that she was also working with the ACOE on the STA 1E, PSTA project. The ACOE has reviewed the District's scope and reduced overlapping / redundancy.

Peter Besrutschko (ACOE), who is working on the C111 PSTA project, said that they are working on reducing the cost of that project. They are also reducing overlaps between ENR test cells, STA 1E and Susan's project. Water chemistry testing is being reduced. They are also reducing the size of the PSTA, from 20' x 100' to 10' x 100', and by cutting back on the number of cells to 3. The cost estimate was \$2 million, which is too high for a project of this life span. Peter said there is some question of ACOE authority to do water quality research in the area of the C-51. There is also a second PSTA project proposed for the area of the C-111, and a supplemental Memorandum of Understanding is being generated between the USACE, ENP and the District. The District is involved for site access issues only.

Susan said the agencies are exchanging information such as uptake rates, and the response of the plants to the created environment. Susan said that low phosphorus concentrations in the area of the C-111 project is a concern in applying the information to the EAA.

Bob Kadlec said that there is also a research project on the effects of re-wetting and phosphorus release underway in St. John's River Water Management District (SJRWMD) that the District should contact and share information with. Susan said that would be the Lake Apopka project, of which she is aware. She also said that she has been contacted by staff from SJRWMD looking for information on alternative treatment technologies, as well as by vendors currently under contract with SJRWMD (who are looking for opportunities to do work for us).

## **5. UPDATE ON TALISMAN LAND PURCHASE**

Bill Malone, Director of the District's Construction and Land Management Department, updated the group:

Bill said that the current contract is much different than the 12/97 agreement. This agreement includes 5,000 acres that Talisman does not have the right to farm for an extended period beyond settlement. The current situation has the District participating in discussions for use / bartering of the land. There will also be opportunities for participation by interested 3rd parties.

The Nature Conservancy is actually the buyer. There is minimal District funding involved at this point, although if STA swaps are involved the district could be a significant financial partner. The cost is \$133.5 million, with closing scheduled in 12/98. The District will pay some closing costs, and up to \$250,000 to the Nature Conservancy if there is no other way they will get paid. Jennifer Jorge asked if the trading will be completed by 12/98 - Bill said they will try. No exchanges have been agreed to yet.

Bill confirmed that if it was desired to take more Talisman land out of production sooner, additional expense would be incurred.

There are about 50,000 acres involved. About 45,000 acres of that total will be fee owned, and about 5,000 will be leased. Bill said that Talisman may donate the parcel near the Refuge, so it may be worth discussing land options with the US Fish & Wildlife Service. Su Jewell said that this is probably adjacent to their "Compartment D Wildlife Management Area". Su asked if the Refuge was going to be involved in any land trades. Bill did not know whether the Refuge would be directly involved, but said he would welcome the opportunity to brief Su Jewell in more detail on what he knows regarding the above land option idea.

## **6. EXTENSION OF OCEAN CANAL IMPROVEMENTS**

Joe Schweigart said that the current S-5A Diversion project does not include the approximately 2 mile portion of Ocean Canal east of proposed Structure G-341. The S-5A project will increase the capacity of the Ocean and Hillsboro canals to divert water from the S-5A Basin west and south, to pump station S-6 and STA 2. The proposed extension is not in the current design package for the S-5A Diversion works.

Jim Kunard said that this component is needed under two scenarios, a long term one and a short term one. Over the long term, the District's Operations personnel will be required to operate the system such that the minimum amount of water is either bypassed around STA 1 and 2 or sent to tide. If capacity exists in one basin or another, the system should be able to handle flows either way. The reach of canal under consideration is significantly narrower than adjacent reaches and restricts flow.

Short term, we will have STA 1W and 2 operational, but STA 1E will not be. To avoid bypass to the Refuge in that time frame, this 2-mile segment needs to have its capacity improved.

Jim said that the Extension project is currently funded in the ECP budget. Construction costs are currently estimated at just over \$700,000, and there are also some design, utility, and land / right-of-way cost centers. Enough modeling, surveying, land research and soil exploration has already been performed to budget the work, and get ready for design.

Tom MacVicar asked if there would be the same level of land-owner coordination efforts with the Extension as there were with the S-5A Works project. Joe said that there are some, but not nearly of the same magnitude. Tom said that from Gladeview Drainage District's perspective, this is a positive move.

Bob Kadlec and Bill Walker asked if the District was also creating a related operating scheme at this time? Joe said no. Galen Miller said that the project is intended to add operational flexibility, not a quantifiable flow.

No further comments were offered, nor contrary viewpoints raised. Joe Schweigart said that staff feels strongly about the need for this work, and that the timing for construction would be in the early 1999 time frame.

## **7. MISCELLANEOUS**

Next meeting is August 19. The group preferred the afternoon. The Corps will be present to talk about STA 1E.

Bob Kadlec asked if the District would update the group on its C51 monitoring efforts, and Tony asked if the District would be prepared to discuss specific plans to avoid discharging seepage water back into the STAs (especially STA 1W and 2, since they are under construction).

C: File (w/att)  
STADG list

MtgSTADG798

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS

August 19, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Randy Bushey, SFWMD
Bob Kadlec, repr. USDOJ	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Ron Hilton, Burns & McDonnell
Tom Kosier, SFWMD	Tony Federico, MFL
Tom MacVicar, MFL	Blake Sasse, GFC
Jennifer Jorge, SFWMD	Paul Moczynski, ACOE
Trent Ferguson, ACOE	Tom Corcoran, Nat'l Audubon Society
Andre Cadogan, SFWMD	Angela Berry, Brown & Caldwell
Alex Perez, SFWMD	Charlie Geer, Kimley-Horn
Bruce Arrington, USFWS	Allen Wertepny, Mock, Roos
Dan Clark, Brown & Caldwell	Jim Sturgis, SFWMD
Tom Johns, SFWMD	Don Nuelle, SFWMD
Susan Coughanour, SFWMD	Su Jewell, USFWS
Dan Shalloway, SFRN	Mike Zimmerman, ENP
Angie Dinkla, Burns & McD	Eric Hughes, USEPA
Sherry Scott, SFWMD	Ed Brown, ACOE
Chris Smith, ACOE	Dr. Ron Jones, FIU, consultant for ACOE
Rich Meeker, SFWMD	Pete Rosendahl, Flo-Sun
Joan Lawrence, SFWMD	

Handouts: Agenda, 7/7/98 Notes Correction (one 8 ½ x 11), Tentative Agenda List (one 8 ½ x 11).

- 1) **MEETING HIGHLIGHTS CORRECTION.** See Tony Federico's requested change.
- 2) **U.S. FISH AND WILDLIFE SERVICE.** Su said that Mr. Mark Masaus (pronounced mah SAY us) has now taken Burkett Nealy's place. He is a 25 year veteran of the agency, and started out his career at Loxahatchee. Also, Su has accepted a promotion to Washington, D.C. Mr. Bruce Arrington will be representing USFWS at these meetings. The STADG wished her a fond farewell.
- 3) **STA 1 EAST / West C51 Canal.** Jim Sturgis said that the pump machinery contract was let for bids on 8/10 - it represents about 8,000 cfs of pump capacity. The design of the pump stations themselves has started. Jim introduced Chris Smith, ACOE, who walked through the design of the STA itself. Chris said they were authorized to do this work under the 1996 WRDA, Section 315. They are basically following the Burns & McDonnell Conceptual Design document, and the General Design Memorandum.

Chris related the basic project components:

- Spillway S-155A (just west of State Route 7) marks the east boundary of the West Canal C51 basin. The C51 effort consists basically flood control improvements. A capacity increase for C51 canal is planned.
- Pump Station 319 (3,980 cfs) will pump water from C51 to STA 1E.
- Pump Station S-362 (formerly S-326) will lift STA 1E water to the Refuge. It is at 4,200 cfs.
- Pump Station 361 (about 70 cfs) will collect both seepage from the STA and runoff from residential and agricultural areas southeast of STA 1E. These areas will be severed hydraulically from C51 by the STA.
- It is hoped that Seepage Water along the northeast boundary can be made to drain north to C51.
- STA 1E.

Chris related the hydraulic design approach: They used HEC-RAS (River Analysis System), for canals (a 1 dimensional program), and RMA-2, a 2-dimensional program, for the cells. In HEC-RAS, they used a roughness coefficient (Mannings "n") of 0.84. They used a variable "n" for the treatment area to account for varying roughness at different depths, which affects levee design. The output of the RMA-2 program will provide velocity vectors in the cells.

Gary Goforth asked if there was an analysis of STA flows and depths for the 1979-88 Period of Record yet, including a dryout analysis - Chris said that there isn't, but it will be done.

Chris described the modifications they want to make to the GDM:

- Added the 700 Ac +/- Distribution cell along the north boundary.
- Better topographic info has led to cell geometry changes. In the northeast corner elevations get up to 18.5' and 19'. In the southeast corner, around 12.5', and in the northwest corner, around 10.5' - 11.0'. Cell 4 was divided into 4 North and 4 South (4N, 4S). Cell 7, in the GDM, was a triangle shape. This caused the water to get "pinched" at the south end resulting in uneven staging, so it was cut off further north, and Cell 6 was made larger.
- The District requested no flashboard risers.

Chris went through the design cell by cell:

- a) **Distribution Cell.** FP&L has a major transmission line running east-west through this cell on the south side, as well as a north-south segment in the westerly third of the cell. Dan Shalloway asked if ACOE was concerned about the depth in this cell, and Chris said they were not. The cell is intended to distribute flows, and is not primarily for treatment.

Pete Rosendahl asked why there needed to be distribution cell, since there is the STA 1 Inflow & Distribution (I&D) works just to the west. Jim Sturgis said that I&D is to handle pump station S-5A discharge routing to STA 1W,

and provides flexibility to divert flows to STA 1E (cells 5 and 7) if needed. The Distribution Cell is to handle S-319 flows from C-51W. Mike Zimmerman asked if the cell arrangement was reasonable in terms of differences in phosphorus concentration between the inflow sources. Galen said that I&D supplies about 16% of the load. Jim said the ACOE would make sure it made sense.

Chris said I&D water could physically reach the east cells through proposed culverts under the (north-south aligned) FP&L easement, but the hydraulics make it unlikely.

- b) **Cell 1.** Chris said topography he reported in the mailing, in general, is from the top of the highest berm to the bottom of the lowest ditch. In this cell, it ranges from elevation 23.94' to 10.48', with an average of 17.4' and a proposed average of 16.5'. The soil is sand, which is highly suitable to build levees. It is the Corps' plan to both lower and even out elevations in the cell and supply material for levees in other areas by moving spoil from Cells 1 and 2 to other cells.

Bob Kadlec asked about the 1.25' difference between the proposed average ground and the proposed static water elevation. Chris acknowledged that it was being used, and said it will result in about an average 2' depth and will help maintain a minimum 6" depth in dry weather. Galen Miller said that factor was used in all the STAs so far, and Tom Kosier agreed that it was appropriate.

Bob asked how that meshed with the 70 cfs pump capacity? Chris said that represents both seepage and collection of drainage from facilities that will be severed by the STA. Chris said they were using 10 cfs per foot of head per mile for levee seepage.

Chris said that groundwater analysis is to be contracted out to Dr. David Genereaux of FIU.

At Tony Federico's request, Chris showed the flow paths of each treatment train, and to where they discharge.

Su asked why the ACOE wanted to grade the cells, when it looks as though the natural grades could be used. Chris said that the fields are distinctly terraced, like flat stair steps. The current cell layout will take advantage of that.

Dan Shalloway asked the ACOE to see if the creation of more storage in the Distribution Cell was possible. Chris said that currently, 4 to 5 ' will be the normal water depth in that cell.



- c) **Cell 2.** Elevations range from 19.81' to 13.06'. The average elevation is 16.51', and the proposed is elevation 14.0'. The outlets will be gated culverts.

Tom MacVicar asked if the ACOE was concerned about what type of soil remains in the cell, if the top is scraped off and relocated. Chris said there is virtually no muck now in cells 1 and 2.

Tony asked if each cell will be operated at the same depth? Chris said that is the premise, but cell 7 will be hard to maintain that way, as it is the lowest of all the cells. Cell 7 will have to build up, and discharge in a pulsing fashion. Rich Meeker asked how that would affect daily depths, for proper plant growth. Chris will review during the STA flow and stage analysis.

The group asked if the regrading concept will increase the cost? Paul Moczynski said that it has somewhat. Also, he reported that the current estimate has increased to about \$210 million (previously at \$165 million). The local sponsor cost has only changed by about \$1 million, however. That figure has a 25% contingency, and includes a \$16 million increase in pump stations, as they were changed to meet ACOE design criteria. That figure includes canal improvements, land acquisition and Structure S-155A.

Pete asked if it included L-8 Canal inflow - Chris said no.

Bob and Gary asked if the ACOE would re-evaluate the capacity of the outflow pump station. Chris said no - it is sized for flood protection, and with the current timelines, they have proceeded.

Bob asked who, if anyone, is looking at what the 4,200 cfs outflow to the Refuge will do to it? Jim said pumping at that magnitude that was an infrequent occurrence. It will discharge into the L-40 borrow canal for distribution along the perimeter of the Refuge, with possible spill over into the marsh. Chris said they will investigate the impact to the refuge from this discharge.

- d) **Cell 3.** Elevations range from 18.34' to 11.09'. The average elevation is 15.14'. The proposed elevation is between 15.5' and 16.0'. This cell is planted in citrus, which will be a challenge to start up as an STA.
- e) **Cells 4N and 4S.** Cell 4N: Max = 19.01', min = 10.16', avg = 14.83'. Proposed grade = 13.5' - 15'. Cell 4S: Max = 18.27', min = 10.09', avg = 13.06'. Proposed grade = 11.0 - 13.5'. Both cells are planted in citrus.
- f) **Cell 5.** Elevations range from 18.57' to 11.04'. The average elevation is 14.15'. The proposed elevation is between 14' and 15.0'. This cell is also planted in citrus at this time.

- g) **Cell 6.** Elevations range from 24.91' to 8.75'. The average elevation is 12.64'. The proposed elevation is between 11.5' and 13.5'. This cell is planted mainly in sugarcane.
- h) **Cell 7.** Elevations range from 22.26' to 9.17'. The average elevation is 11.76'. The proposed elevation is between 10.5' - 12.5'. This cell is planted mainly in sugarcane.

Other pertinent data: Chris said that the culverts from the Distribution Cell to the treatment cells will be gated. Interior facilities between cells will be fixed weirs, and there will be gated culverts to the discharge canal. There will be no active individual cell control. Gary noted that there would, however, still be control over a flow-path if needed (for instance, cells 1&2, 3-4N-4S or 5,7 & 6 could be taken off-line).

Bob Kadlec felt there may be a problem with short-circuiting at the east-west oriented interior levees, but Chris explained that there will be collection and distribution canals on either side. Bob felt that, in that case, there might be up to a 10% increase in performance due to those 2 features.

Bob recommended that the Corps spend some time thinking about how to balance the loads to individual cells if the P concentration is different between sources.

Bob asked about the handling of seepage. Chris said that they hope to divert seepage from the east side of cells 1 and 2 north to the C51 Canal by gravity. South of Cell 2 and east of Cell 4S would be collected, joined by runoff from the Rustic Ranches development and farms to the east and south, and then pumped into the northerly third of Cell 4S (pump station S-361). Bob suggested that facilities need to be provided to lift seepage into the nearby discharge canal if it is of suitable quality. Although Bob also felt that facilities needed to be provided to bring the seepage back to the headworks (to keep the STA wet), Chris said that was not planned. Apparently, he feels that flows in the C51 will be sufficient to keep it wet. Gary asked Chris to confirm that the Corps will consider operational flexibility to allow direct seepage discharge to the Refuge and that C51 will be adequate to keep the STA wet. Bob strongly recommended that a Dryout analysis be performed over the Period of Record. Dan Shalloway asked when the seepage report would be available - Chris said Dr. Genereaux's contract has not even been negotiated yet.

Pete asked if there would be a Periphyton STA (PSTA) on site. Paul said that the Corps is comparing work efforts to avoid duplication, and are trying to come up with a site-specific test.

Su Jewell asked who was responsible for Water Quality - Paul said that is not answerable right now.

Dan asked what the design status of S-155A was. Chris said they will review its design this fall after the STA is further along. Dan is interested in its ultimate capacity.

Jim Kunard asked what improvements were planned for C51 west of S-155A. Chris said that in the western reaches of that canal segment, right-of-way will be purchased for a canal widening effort (west of Big Blue Trace).

Chris said that the Detailed Design Report (DDR) will be available to the STADG this fall.

Alex Perez said that the ECP will issue a Financial Schedule update soon - Paul will send revised cost estimates as soon as they are available.

Su said that the ACOE Restudy is showing 2 barriers in the L40 south of STA 1E to hold water in the north end of the Refuge - and wondered what the 4,200 cfs STA 1E discharge would do in this event. Max Day said they were shallow berms on the bottom of the perimeter canals.

Joe Schweigart asked about the schedule. Paul said that, until the Project Cooperative Agreement (PCA) is approved, they are limited by their current authorizations. It is at the Secretary of the Army in ACOE Headquarters in Washington, D.C. Paul said it is an untraditional project, and is therefore hard to explain. Paul said that the delays in approval have not yet affected the schedule, but they can't award the pump station machinery contract, condemn land nor obtain Right of Entry agreements without the PCA and an approved design report. Joan Lawrence said she was willing to help, if the Corps could identify anything the District she could do. This is also interfering somewhat in obtaining survey and geotechnical data.

Jim Kunard asked when the ACOE would be able to supply the next update. Chris said that it would probably be after the new year.

#### **4. STA UPDATES**

**A) STA 1W:** Inflow canals, levees, and control structures are underway. Production blasting is scheduled for the Discharge Canal at Cell 5. G-303 (the inflow structure for ENR) has walls cast in place now. The project is currently about \$45,000 under its \$18,000,000 budget right now, and is still scheduled for March 1999.

**B) STA 1 Inflow & Distribution Works:** Jim Kunard reported that the northwest wingwall for structure G-302 has been cut off and formwork is underway for the cap. The second lift of the separation levee has been placed. G-300 is slipping a little behind schedule, but the contractor plans to remobilize there soon.

**C) STA 2.** Jim said that the inflow levee is nearly done, and the inflow structures are to start soon. The West Perimeter Levee is underway. Interior Levee 2 is nearly connected to the Inflow Levee. Structure 334 will have its final foundation pour this week. At G-337, the seepage canal has been demucked and blasted. The supply canal is demucked also, and will be blasted shortly.

**D) STA 3 / 4.** Jim introduced Mr. Randy Bushey to the group. Randy was recently hired to be the Project Manager for STA 3 / 4. Randy said that the second mandatory pre-proposal conference was held. Proposals are due on 9/1/98, and the shortlist meeting is slated for 9/15. The follow up, verbal presentations are to be held on 10/1. One hundred proposal packages have been issued to date. Approximately 20 firms participated in 2 separate site visits.

**E) STA 5.** Tom Johns reported that the southwest cell has been wetted. The L3 levee has been breached and water is flowing through the southerly inflow structure and into the distribution canal. Tom said that the contractor is 4 to 6 weeks ahead of schedule right now. The Discharge Canal is demucked, and blasting is anticipated next week.

The Pump Station 404 & 409 / G-357 / L-4 Levee Breach project ("W.WCA 3A Hydropattern Restoration") is anticipated to start in September. The Pre-Construction Conference is scheduled for 8/20/98. The contractor is Gilbert-Southern. Pete asked why electric power was chosen over diesel. Joe said that the cost of bringing power is compared to other aspects, like life cycle operating costs, remote operation, equipment reliability, and frequency of operation. Pete asked if this work was part of the ECP - Gary said yes, it will eventually be used for West WCA 3A is hydropattern restoration and will mitigate for the diversion of C-139 basin flows into STA 5.

**F) STA 6.** Tom Kosier said that the STA was dry for nearly 100 days. It was filled again by July 16. Tom reported the following "snapshots" of phosphorus levels (in ppb):

<u>Date</u>	<u>Inflow</u>	<u>Outflow</u>
7/20	65	54
7/27	56	38
8/3	65	31
8/10	91	28

Tom said that, this time, there is no apparent P spike from the dryout. It is operating at about 200 - 300 cfs. Pete asked if that would be representative of the influence of drydowns at other STAs. Tom said we don't know, but there are similarities between this site and other vegetated areas.

**G) Outflow Pump Stations G-310 and G-335.** Mobilization is underway. Concrete batch plant development is proceeding. Excavation has begun at G-310. Temporary power has been brought to that site. The cost-loaded schedule has been submitted.

## **5. FUTURE AGENDA ITEMS. (see handout)**

Jim went over possible agenda items, including STA 3 / 4 design issues. The District wants to try to make sure it is doing everything it can to be ready for the start of design early next year. In general, the group felt we needed to wait for the design consultant to participate in technical discussions, but offered suggestions on what info may be necessary to make decisions.

In item C.1, "HR", the District will need to also supply the results of research (Tom Fontaine). Timing and quantity of available flows is needed.

In item C.2, "Footprint", the group felt that more muck probes may be useful.

In item C.5, "Startup", the group felt that discussion should wait until next spring.

For item C.7, "Lake Releases", more info may be available at the next STADG meeting. The corps is evaluating a proposed change in the regulation schedule, and no final decision is expected until next year.

Item C.8, "Seepage", a) think of ways to remain flexible, b) evaluate shallow hydrogeology somehow. Bob Kadlec said that the group will need to consider how (or whether) to account for vertically lost P from budget computations and for compliance considerations. Jim said that the project should probably take credit for its removal.

Item D, "Op Plans", will be scheduled for the next meeting.

Item E, "Interim Report", a draft is to be issued for public consumption in September. It will be scheduled as an agenda item for the next meeting. A sign up list was offered for those who would like to have a copy of the draft mailed to them. Gary said that the Interim Report has direct affects on STA 3 / 4 per Everglades Forever Act direction. Garth Redfield is heading up the effort.

## **OPEN DISCUSSION / SET NEXT MEETING**

The next meeting was tentatively scheduled for Tuesday, October 20, 10:00 a.m. Location to follow.

C: STADG mailing list  
File (w/att.)

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS  
October 22, 1998

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Linda McCarthy, FDACS @ SFWMD
Bob Kadlec, repr. USDOI	Ron Hilton, Burns & McDonnell
Joe Schweigart, SFWMD	Jenni Hiscock, SFWMD
Tom Kosier, SFWMD	Randy Bushey, SFWMD
Tom MacVicar, MFL	Blake Sasse, GFC
Rich Virgil, SFWMD	Victor Powell, SFWMD
Andre Cadogan, SFWMD	Don Nuelle, SFWMD
Alex Perez, SFWMD	Pete Rosendahl, FCC
Susan Coughanour, SFWMD	Bruce Arrington, USFWS
Dave Silverstein, B&M	Mike Zimmerman, ENP
Jim Sturgis	Garth Redfield

Handouts: Agenda, 1 page memo on Rotenberger in-holdings acquisition status, "STA 3 / 4 Design & Construction Schedule" (one 8 ½ x 11), packet: "C51 Canal Monitoring, Year One data".

**1) ROTENBERGER ACQUISITION STATUS**

Rich Virgil shared information from the Florida Department of Environmental Protection (FDEP) regarding how well the land acquisition process is proceeding. Rich explained that the FDEP has recently been authorized to acquire land by eminent domain (the 1,900 acres / 187 owners). There are only the 1,900 acres left to acquire of the 29,000 + acres in the tract.

Joe Schweigart asked if the lack of total acquisition would affect the project, and Rich said that only operation would be affected. Rich said that according to the District's 404 permit, the outflow culverts are to be blocked off early next year. One year of monitoring of stages (rainfall only) will follow, and a regulation schedule will then be developed. The Rotenberger pump station is scheduled to be constructed in that year.

Rich was asked a few questions which he researched after this meeting. Here are the answers:

**Question 1: What is the source of money being used to purchase the Rotenberger in-holdings?** *Answer: Preservation 2000 funds.*

**Question 2: Can we initiate the rain-driven hydropattern restoration once the Order of Taking is filed?** *Answer: Per DEP, the District can only deposit*

*water on lands that have title transferred to the state. The title transfers when DEP deposits money into the court registry for the Order of taking. DEP is probably a couple of months away from this.*

## **2) UPDATE ON THE PEER-REVIEWED INTERIM REPORT**

Garth Redfield gave a briefing off of the "Major Findings and Preliminary Implications (review Draft 9/17/98)" that was mailed to STADG members. He said that the report is on the website now. The report, which summarizes data and findings, does not reflect "opinions"; it is a scientific report.

He said the chapter format used tries to conform to the Everglades Forever Act (EFA) format. Garth touched on pertinent facts: He said that phosphorus is evidently still the main concern in restoration. Regarding STA 3 / 4, we can't consider not going forward. Considering the final criterion for phosphorus, currently available data shows that shifts in flora begin to occur in the 10-20 ppb range. Something less than 5% of mercury inflows to the Everglades Protection Area (EPA) can be attributed to runoff, the rest from atmospheric deposition. The standard is currently 12 nanograms / liter, but may change. The Everglades Nutrient Removal (ENR) project pulls half or more of the mercury out of the water, but it is not a sure thing that all STAs will do that. Further, the captured mercury does not seem to be accumulating in the ENR's fish population.

Garth said that they are incorporating review comments now, then will repost the report to the web.

Pete Rosendahl asked whether a draft, unpublished report by Chris McVoy is available yet. Garth said it was not peer-reviewed except by the USGS at this point. Tom MacVicar also wants a copy. Garth said it was still in Dan Cary's area.

Garth said that some revisions are coming to the chapter on Best Management Practices (BMPs), due to some missing data sources. In general, the BMP program is good news, recording good performance, and more reductions might be possible.

In Chapter 12, Gary Goforth reports that although early operation of ENR and STA 6 Section 1 reveal a good ability to remove phosphorus, natural systems can take years to stabilize, and that low outflow concentrations may not be consistently produced in later years.

Garth noted that the Restudy, 3700 pages long, is in the process, too. STA 3 / 4 cannot wait for its approval and implementation process.

Garth said that the Interim Report is due to the Governor on 1/1/99. He said it is a "living" document, and he expects to update it annually in the form of supplements, not replacement documents.

Bob Kadlec and Pete Rosendahl discussed the ENR performance. It has been averaging 22 ppb outflow concentration over its first 3 years. Pete felt that it may be beyond its grow in period, and perhaps could be relied upon for that performance. Bob said that we should expect it to fluctuate.

Bob asked if it was too late to offer input to the Interim Report. Garth said he would still be able to accommodate specific comments or criticisms if offered quickly.

Bob questioned page 6 of the summary, where it recommends use of the current basic STA design parameters for STA 3 / 4. Jim Kunard answered that the basic design parameters will be reviewed, considered and adapted to this STA, and this work is in the design consultant's scope.

The Interim Report indicates that Phase II technology will probably not be available in time for STA 3 / 4. No funding for Phase II has been identified.

### 3) **STA UPDATES**

#### **A) STA 1E.**

Jim Sturgis said that the PCA is still pending. Tom MacVicar asked how long it can wait before the schedule is affected? Jim said it would be a few months. Tom asked if the lack of Rights of Entry would affect anything. Jim said that the PCA needed to be executed before the machinery contract award in January 1999, but that delay in executing the PCA was not delaying the acquisition of rights-of-entry for surveying and geotechnical site work. Some STADG members remembered the opposite from a previous meeting - Jim said he would get with the Corps and respond.

**Jim checked with the Corps after the meeting: The Corps reports that the right-of-entry condemnations can and are proceeding without a PCA. The Corps believes they will have access by 12/1/98.**

Jim said that the bid opening for the pump station machinery is slated for 10/29.

**B) STA 1W:** Victor said that startup is on the horizon, with opportunities to wet cell areas coming shortly. Facilities for intercell transfer are under construction.

**C) STA 1 Inflow & Distribution Works:** Structure 302, which supplies STA 1W, is nearing completion. BMP makeup releases are still being sent through the



ENR. Bob asked when cell 5 would be wetted - Victor said it is likely to occur in January, but the contractor does have until March.

**D) STA 2.** Victor reported that cell 1 is wet now, and has been so fairly consistently due to dewatering activities. Few of the plant species are showing any great distress, but there have not been very deep stages yet.

G-337 (seepage pump station), has undergone excavation and some foundation wall concrete pours.

**E) STA 5.** Rich Virgil said that the inter-cell structures are under construction. Most of the levee work is complete.

Team Land is working the discharge canal. There has been no blasting needed at the west end, but there is some very hard rock at the east.

**F) W.WCA 3A Hydropattern Restoration.** The G-409 pump station is under construction. Its intake and discharge bays have been cast. G-404 will be starting soon. Clearing of the L-5 levee has also started.

Tom MacVicar noted that the 570 cfs G-404 might need to be increased in capacity, considering the LEC plan and the Restudy. Rich said it was too soon to plan for any more capacity than what we have now.

**G) Rotenberger Pump Station.** G-410 is planned to be bid in January. It is a 240 cfs installation.

**H) STA 6.** Andre Cadogan said that the September 8, 1998 reports indicate 50 ppb of phosphorus in the inflow, compared to 24 ppb in the outflow. There was apparently no large "flux" in outflow concentration due to the dryout.

**I) Outflow Pump Stations G-310 and G-335.** Construction has started with land preparation and excavation. Harry Pepper & Associates have erected a batch plant near the S-6 pump station.

**J) S-5A Diversion Works.** Joe Schweigart said that 3 bids were received:

Harry Pepper & Associates	\$18.8 million
Smith & Co.	\$12.0 million
IT Corporation	\$9.15 million
District Estimate	\$10.5 million

At this point, IT Corp. is the apparent low bidder. Their bid included 13 + % Minority / Woman Business Enterprise (M/WBE) participation. The goal was 11%. No Good Faith Effort was required, because IT's bid apparently exceeded

the goal. The recommended award should be on the November Governing Board agenda.

**K) 298 Districts / Closter Farms Diversion Projects.** Jim Kunard said that the 298 District projects are over budget. In October, the Governing Board agreed that they need to stay on schedule. As such, they are re-designing to reduce cost. To build just East Beach and East Shore, all of the budget for the 4 affected agencies will be used, plus approximately \$1 million more. Expenditures for South Shore Drainage District and South Florida Conservancy District design will be deferred until closer to its scheduled implementation.

Jim said that Closter Farms diversion activity is proceeding on schedule, however, current estimates put the cost very close to the currently budgeted figure, with little contingency.

- 4) **STA 3 / 4 Update, & Set Design Parameter Meetings.** Randy Bushey handed out a schedule showing the currently published project schedule vs. the top-ranked consultants proposed design schedule (Burns & McDonnell). The dotted line represents the schedule to be negotiated. It shows the project meeting the EFA date for construction (pump stations on line), with an indeterminate amount of time for start up. Joe Schweigart reminded the group, however, that schedule changes are tied into available funding. Joe said that the competition was fierce for the design work. The Burns & McDonnell team was ranked number 1, followed by the Kimley-Horn / Post, Buckley, Schuh & Jernigan team and the Hazen-Sawyer / PEER Consultants team. It was a very close competition between the top 2 consultants. Negotiations for the contract are slated to begin next week.

Randy said that the District desires to negotiate only the first 30 to 40% of the design at first. Then, having done alternatives analysis and a thorough scrutiny of design parameters, proceed to negotiate the balance of the contract. Through this process, a better price will be negotiated, due to the fact that the remaining scope will be clear and well defined. It would also be the District's desire to have the 100% complete pump station equipment procurement specifications done in the initial contract as well. The initial phase of design would take approximately 1 year, with the balance taking an additional 15 months or so. Staff is going to try to seek Governing Board approval in December.

In keeping with the District's desire to encourage participation in design issues, and as noted at recent STADG meetings, Jim Kunard said that in-depth discussions with Burns & McDonnell and District staff, on inflow, outflow, Restudy issues and some design parameters, should be planned. It was agreed that, on December 7, 1998 a "Mini" STADG meeting would be held to discuss inflow/outflow details and other issues. Pete Rosendahl, Mike Zimmerman, Bob Kadlec, Tom MacVicar and Max Day want to participate. A second one will be held on January 5, 1999, to address seepage and other issues.

- 5) **C51 Monitoring results.** Jim Sturgis handed out the "Year One Data" (dated 10/22/98) for water quality monitoring in the West C51 Canal. The two graphs showing Flow and Phosphorus Concentration (for the S-5AE and SR 7 monitoring stations) were reviewed and discussed. Jim said that the Indian Trails Improvement District (ITID) off peak flows in the M1 canal were not monitored for volume, so that needs to be considered. Also, between 12/97 and 4/98, the "El Nino" effect caused unseasonal heavy rainfall. Jim said that this resulted in increased discharges in the C51, due to an endangered species concern to the south. In November of 1997, there was little rainfall, so the flows were very low. This happened again in June of 1998, so the farms were in an "irrigation mode" then. Jim said the canal only very infrequently flows west. It has happened only 3 weeks in 20 years.

On the S-5AE station results, Jim noted that the automated flow monitoring didn't initiate until December 1997.

Bob Kadlec asked why the on-site monitoring results differed from the grab samples, and Jim said he would investigate.

Bob asked what the data meant for Water Quality forecasts to STA 1E. Jim said it would be hard to predict, because ITID / South L-8 water will ultimately be directed elsewhere. There is a Memorandum Of Understanding (MOU) between the District and ITID, however, that permits ITID discharges in off peak situations, which will presumably be bled to the east , or to STA 1E should capacity be available.

- 6) **MISCELLANEOUS.** The next meeting is tentatively set for January 26, 1999, 10 a.m. -12 p.m.

C: File (w/att)  
STADG list

MtgSTADG1098

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS  
**STA 3 / 4 INFLOW AND DISCHARGE ISSUES**

December 7, 1998

Attendees:

Jim Kunard, SFWMD	Randy Bushey, SFWMD
Bob Kadlec, repr. USDO	Gary Goforth, SFWMD
Angie Dinkla, Burns & McD	Galen Miller, Burns & McD
Tony Federico, MFL	Jennifer Jorge, SFWMD
Bill Tarr, Flo-Sun	Tracy Piccone, SFWMD
Laura Reilly, SFWMD	Pete Rosendahl, Flo-Sun
Max Day, SFWMD	Mike Zimmerman, ENP
Renee Rasha, PBC DERM	

Handouts:      Bullet Sheet on Upcoming Burns & McDonnell Deliverables, December 7, 1998 Meeting Objective Sheet, 14 pages of Flow & Load data, one sheet showing Factors Influencing Design. A draft letter was handed out by R. Kadlec regarding the feasibility of Periphyton STAs.

Objective:      To solicit input from the "STADG members" and the public on STA 3 / 4 Design Parameters that influence the STA footprint.

Background:    The participants of this meeting volunteered to discuss STA 3 / 4 design issues with the District and its consultant at the October 22, 1998 regular STADG meeting. This meeting and another on January 5 were scheduled.

- A.      Randy Bushey presented a table of design deliverables from Burns & McDonnell. He reported that, presumably, on December 17, the details of the Talisman land acquisition should be made public. The construction of the STA is scheduled to begin in October of 2001 and be completed by October of 2003. Pete Rosendahl asked when the report recommending the design footprint was going to be available. Randy said that the draft report was due on March 17, 1999. Between now and then, basic alternatives will be considered, including thoughts toward how flexibility for a potential Phase II technology could be included. Pete said that, as far as he is concerned, as long as no technology was actually constructed, it would be no problem to leave space for one. Randy said that the draft report would be finalized between March and June, whereupon it would become the "District's Draft STA 3 / 4 footprint alternatives analysis" and be forwarded to the Corps in support of the STA 3 / 4 construction permit application. Gary Goforth said that the STADG is being used as a public input forum in support of the Corps permit. The final footprint will be determined after the public input and Corps 404 permit is issued.

Tony Federico and Bob Kadlec expressed a desire to review each of the 80+ deliverables in the initial design contract as they become available. Randy suggested that they wait until the documents, which build on one another, are reviewed by the District (one or two weeks after delivery from the consultant). Tony felt that the District would have little motivation to incorporate comments if they weren't received until after they were compiled into a larger document in June or July 1999. Randy reminded the group that the design schedule contains zero float if the goal of achieving flow-through operation on time is to occur. Gary said the District would find a way to provide the documents in a timely manner, but that extensive review periods must be avoided. Bob was concerned that time in shipping would be a significant part of the review period. Jim Kunard said that outside reviewers would have to be just as serious as the District is in complying with timely provision of comments. The District doesn't want any schedule slippages.

- B. Gary opened a discussion on what Period of Record (P.O.R.) could be used in the design. The Conceptual Design used the 1979 - 1988 time period, which was relatively dry. He said we could look at the 1965 - 1995 period, but that there is only limited associated Water Quality data prior to 1978. Bob suggested perhaps using a return period, or frequency basis as opposed to using a P.O.R. Galen Miller said that he feels he will use simulated data, with hydraulics based on the Restudy model. Tony said that there are pitfalls with using the Restudy data and to be careful of assumptions.

Max Day said that the Restudy shows that in 2050, STA 3 / 4 will be oversized. Max said that in the Restudy, STA 3 / 4 was modeled per the GDM design, with a 25% BMP load reduction. Tony asked if it was oversized due to new contemplated reservoirs, and Max said that was not the case in the 2050 study. Gary said we could not ignore major Restudy options

Gary described the data in the handout which shows record flows for various time periods. The 2050 Base and Alternative D13R data was taken from Bill Walker's website. Gary noted the large difference between the 1996 PEIS data and the 2050 Base figures, especially for WCA 2A, WCA 3A (N.E. and N.W.) and S-8. S-140 is within the Miccosukee reservation. D13R assumes upstream reservoirs.

- C. Gary described the phosphorus load data on pages 4-6 of the handout. He said that the Interim Action Plan and other modifications to the operation of the C&SF, along with changes in weather patterns, suggest the 1979-88 P.O.R. may not be the most appropriate for design. Laura Reilly said that monthly data is available, and it was given to B&M during the meeting.

Pete asked if the District was considering mixing the STA 2 and STA 1W basins with STA 3 / 4 - Gary replied that this was not on the table right now, but that Bolles Canal remained a possibility for east-west mixing. Pete said that providing inter-basin transfers would allow the District to shift loads based on STA performance variations. Gary confirmed for Mike Zimmerman that the data on flows / loads are from automated flow-proportion samplers.

Gary asked for recommendations. Pete asked what sensitivity there was - how much will the cost change for changes in P.O.R.? Galen said that the footprint may or may not be affected, but that levee heights, pump station capacities and detention time would be affected, and bypass features. Gary reminded the group that the Federal Settlement Agreement required capture of all 1979 - 88 flows without bypass, and that the minimum area of the STA may be driven by the content of the Proposed Modified Consent Decree. Selection of certain parameters may indicate a reduction in size is feasible, but since Phase II is on the horizon, the District is not inclined to reduce it. Tony said that, since selection of parameters may also indicate an increase in size is needed and would be considered, shouldn't the District, likewise, consider reducing it? Gary doubted that the Settlement Agreement would allow it, although, if a reduction is warranted after review of data, we could raise the issue at a TOC Principals meeting. Bob noted that there are load reduction targets to consider too, and the 50 ppb limit is a long term annual average item; this discourages size reduction.

Bob was curious as to how compliance will be measured. He said STA 3 / 4 will be a leaky system, and appreciable water and phosphorus will probably be lost. He said the DEP recently expressed the opinion that perhaps this loss should not be counted as reduction related to STA 3 / 4. Pete disagreed with that opinion..

Pete said that there may be some risk of the DEP applying groundwater discharge regulations, and that, if this issue is pressed, an absurd conclusion may be reached.

Tony asked if the District could look at direct discharge of seepage, and Gary said the consultant would examine that possibility.

Tony asked if the District will attempt to get permits in advance of construction this time, and Gary said that this was the case for the 404 permit, but probably not for the operation permit. If manpower is available, they can be worked on. Bob agreed that it would be better to know all operating permit conditions in advance. Gary said that meetings are planned with the Corps to strategize the permit, and public notice will be given for receiving input. Gary said they would look at 4 primary items: EAA runoff, Lake Okeechobee releases, Supplemental Technologies and discharge details. There will be a public meeting in January to receive input from agencies and the public. Tony also recommended engaging the EPA as well. Gary said that the District invited all of the Technical Oversight Team members to a meeting recently (EPA, COE, DEP, Tribes, ENP), and not

one party showed up. Tony said that lack of early participation could lead to trouble. Gary said that, if they won't come to the District, the District would go "there". Tony asked if private parties could attend such meetings - Gary will ask them.

Mike said that the regulatory agencies may be hesitant about participating in a work product they will be responsible for regulating. Bob said at least the District could "bounce it off them" to see if there are any show-stoppers.

- D. Galen asked for data related to the LEC plan - notably the 2010 vs. 2050 comparison.
- E. Bob said that he is very interested in two points:
  - 1) He is serious about having the District use actual data related to BMP makeup water, and
  - 2) Is it really feasible to build the STA in its planned location? He has doubts on muck thickness remaining to support a healthy wetland marsh. He heard that there is only 3" at the PSTA test site. Randy said that his review of the borings taken during appraisal indicate reasonable depths from 12"-26" thick "generally". Galen said that his initial scope includes borings and muck probes that will support this determination. Bill Tarr said that the District should coordinate with Mr. Alvarez for access to Flo-sun property within the footprint. Tony and Pete expressed concern as to what would happen if 15%, 20% or more of the STA had only a few inches of muck. Bob said that the location of the thinner muck would be a consideration, too. Gary noted that fully 50% of ENR does not consist of emergent macrophytes, and it is operating well so far. Bob said a recommendation, in event of thin muck areas, would be to plan ahead for management of these areas.

Tony wondered when all the possible changes would add up to a substantial change beyond "standard engineering practice". Gary said all the STAs changed, and DEP was a full partner in those discussions. If the District documents and demonstrates the need for changes, the DEP has generally concurred. Nevertheless, Gary said he would try to get a feel from DEP as to what such a threshold would be.

- F. The settlement rate was discussed. Bob asked if there would be a recalibration of it? Galen said that 10.2 m/yr would be used for footprint determination, then he would look at what potential variations in the settling rate, and items like seepage, and inflow volumes and loads would do with respect to probable performance of the STA. Galen said there has been no consensus on settlement rate, and that it is likely that there will not be a universal consensus during the period of design of STA 3 / 4. Bob said that since 10.2 m/yr was proffered, more data is available, and asked why it should be ignored. Galen said it won't be ignored, but that the footprint will be based on 10.2 m/yr. STA performance can be projected using other data.

- G. The group prioritized the factors that influence the design of STA 3 / 4 into primary and secondary factors. See the attached chart.
- H. Comments:
1. Max said that potential Restudy reservoirs are being decided now, but it was more likely that no agreement could be reached before July of 2000.
  2. "Additional Environmental Releases" of water from Lake Okeechobee would include water released for the LEC plan, or for WCA regulation.
  3. Galen said that, regarding conveyance capacity, he would use Cal Niederaur's model. 1959 and 1978 cross sections were used there. Some field surveyed cross sections of the canals are planned and will be compared to Cal's input data. The project does not now anticipate modeling or design work on the North New River or Miami Canals unless it is warranted after a review.
  4. Bill Tarr asked what the Restudy assumed for the major canals - and Galen responded that D13R assumes that the canals are triple their current capacity. Randy said that the District feels that some work to the canals may be needed, once we discern the actual capacity as compared to that reflected in the District's current hydrologic models. Gary said that some bathymetric data is available, which will be reviewed. Galen said that, if we find the capacity is poor, and flows will be lower than considered in the Conceptual Design, he would need a consensus as to what exactly to model for. Should he design for some future canal improvements?
  5. Gary said that the removal of the Holey Land Toe of the Boot is a required review item of the EFA.
  6. It would be wise to relook at rainfall concentrations, better C-139 data. Bob said that Garth Redfield could provide a rainfall number.
  7. Seepage. Galen reported that tests were planned in the initial design effort to evaluate seepage. This effort includes 5 test wells, one of which will be selected for the conduct of a 96 hour Aquifer Performance Test to assist in projecting deep seepage losses from the STA.
  8. Discharge location recommendations will be in the 3/99 report. Local impacts into WCA 3A will be considered in the design of STA 3 / 4. Tony and Gary disagreed as to whether north WCA 3A was pristine. Bob Kadlec said that Bob Barron will want to see a "zero-discharge to N.WCA" option. Tony said that there is information available called the "Richardson" data.
  9. Bill Tarr is interested in where the location for compliance testing will be. Galen said that with respect to the design of the STAs, the long-term average 50 ppb interim goal established in the EFA is considered end-of-pipe. Bill and Bob felt that the DEP will want to consider alternatives. Bob said it is possible that the EPA will set some other level of compliance.
  10. Gary described a suggestion that Sam Poole has recently made. Because the District has been accused of dragging its feet on Phase II implementation, he is prepared to include provisions for supplemental technology in the STA 3 / 4 design, provided that all parties agree to select one technology right now, and agree to accept its output concentration no matter what it is. Future STADG meetings will be used to obtain stakeholders input on this idea. Bob offered copies of his draft letter related to this



issue for review (on the feasibility of PSTAs). It was agreed that an April 1999 update to the STADG from Susan Gray would be timely.

11. The auxiliary pump stations referenced in the General Design Memorandum for STA 3 / 4 would be smaller pumps added to, or in the immediate vicinity of, S-7 or S-8 for low-flow operations.
12. ENR lessons learned will be brought up at the 1/5/99 meeting.
13. Determination of existing vegetation in the STA footprint will show wetland and exotic-impact areas, and may affect cell layout or early grow in.
14. The potential for incorporation of a buffer cell will be considered, but scientists have not yet reached agreement as to their necessity or the extent to which they are beneficial.
15. Since water supply releases are during dryer times, Mike wondered why that was a concern. Gary said that, if demand is low, Lake Okeechobee stages will be higher - if demand is high, there will be less water released a result of high stages. Lake Okeechobee water supply releases were not contemplated in the Settlement Agreement to be treated in the STAs. Gary said that the STAs are not sized for BMP makeup water releases, however operations could allow BMP replacement water when capacity is available during the dry season.
16. Tony suggested creating a Lake Okeechobee Issue team.
17. Tony asked how the Restudy concepts would be used, as associated with discharge. Galen said that the CD included sheet flow into WCA 3A. Gary said that the 1996 Natural Systems Model (NSM) showed that this would overwet the WCA. Tony advised caution in the use of the NSM. Gary said the "no sheet flow option" will be developed by B&M as one part of the overall alternatives analysis. Tony felt that the "no sheet flow option" could be considered a substantial change beyond standard engineering practice.
18. Galen confirmed that the 3/99 report will include preliminary cost data.
19. Tony cautioned about implementing Restudy options without authority and funding. Galen said that the Interim LEC plan shows westerly flows as well (2050 base). Bob said that the District also can't use the Restudy as a future funding source. Gary said that the EFA requires us to maximize hydropattern restoration, so he would recommend using the Restudy tools to assist STA 3 / 4 design.
20. Bob said B&M should consider episodic releases from Lake Okeechobee in cell configuration determinations. He also said that the federal government seems to want to defer Lake Okeechobee release treatment for Phase II technologies.
21. Gary said that, with respect to the settlement rate, District scientists are saying that the ENR system is still too young, and do not presently recommend using anything other than 10.2 m/yr (as presented in the Interim Report to the Legislature). Bob offered concern that not enough of the ENR related data were going to be used - that is what it was built for. It was agreed to put this on the January STADG agenda.
22. Zaki Moustafa's wetland water quality model should also be discussed at the STADG.
23. Randy said that we should consider flexibility to treat different water sources in the design - it was not wise to reduce the size of the STA. Tony stated a contrary opinion, and would like the STA to be reduced if ENR data supports it.

24. Galen said that the interior levees will be re-evaluated.
  25. Galen confirmed for Tony that the cell arrangement will be reviewed - timing is next summer/fall.
  26. Galen confirmed for Bob that there is not dramatic topographic relief within the footprint like of STA 3 / 4 of a similar nature to those discovered at STA 1E.
  27. Gary asked Max if he could provide simulated results to B&M in the Interim LEC (2010) - Max said not for the Interim LEC, but for Alternative 5. Max said the Barry Rosen demand scenario is available. He will get it for B&M. Galen asked for the results of all simulations for his review.
  28. Gary said not to assume 25% BMP reductions unless recent data supports it. The short BMP history should be reviewed. He said that the Walker website shows 25% as the goal and 51% achieved, but these must be adjusted to the hydrologic conditions. Galen said he will present all the information. Instead of a percent reduction, it was agreed to use a mass load reduction.
  29. Gary said that we cannot wait for the Lake Okeechobee schedule to be set by the ACOE - we need to move forward with the design.
- I. The next mini-STADG will be 1/5/99 in the afternoon - District to advise on location.

#### ACTION ITEMS

Randy Bushey:

- A) Download "Walker" website to Burns & McD to include P.O.R. 2050 Base and Alternative D13R. *Deadline: December 21, 1998.*

Jim Kunard:

- B) Invite Brooks Moore and continue to invite Bob Barron to STADG meetings. *Deadline: December 21, 1998.*

Garth Redfield:

- C) Provide the phosphorus in rainfall factor. *Deadline: December 21, 1998.*

Gary Goforth:

- D) Evapotranspiration data. *Deadline: December 21, 1998.*  
E) Ask if private parties can attend the TOC principals meetings.

Max Day

- F) Provide Barry Rosen's Demand Scenario for the Interim LEC Plan (2010). *Deadline: December 21, 1998.*

## POSSIBLE FUTURE DISCUSSION ITEMS

<u>Sponsor</u>	<u>Item</u>
Tony Federico	Consider benefits of creating a Lake Okeechobee Issue Team
Zaki Moustafa	Wetland Water Quality model presentation
Bill Walker	Nutrient Settlement rate (m/yr) determination for STA 3 / 4 design
Bob Kadlec	Seepage losses and use in treatment - influence on neighboring areas.

## PERMIT ISSUES

- 1) Footprint determination / alternatives report
- 2) STADG as a public forum
- 3) P.O.R. reviews & analysis versus return frequency analysis.
- 4) Interior configuration of the STA
  - ❑ Buffer cells
  - ❑ Levees
  - ❑ Numbers of cells
  - ❑ Separate treatment of Lake Okeechobee water
  - ❑ Phase II technology flexibility
  - ❑ Corps (404), NPDES and Operating permits
  - ❑ Threshold for design changes that would trigger a supplemental PEIS

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS  
**STA 3 / 4 DESIGN ISSUES**

January 5, 1998 ~~98~~ 99

Attendees:

Jim Kunard, SFWMD  
Bob Kadlec, repr. USDOI  
Angie Dinkla, Burns & McD  
Tony Federico, MFL  
Zaki Moustafa, SFWMD  
Laura Reilly, SFWMD  
Max Day, SFWMD  
Mike Chimney, SFWMD  
Bijaya Kattel, GFC  
John Bretz, Sverdrup  
Keith Jackson, SFRN

Randy Bushey, SFWMD  
Gary Goforth, SFWMD  
Galen Miller, Burns & McD  
Blake Sasse, GFC  
Tracy Piccone, SFWMD  
Susan Gray, SFWMD  
Mike Zimmerman, ENP  
Tom Kosier, SFWMD  
Gene Duncan, Miccosuckee Tribe  
Tom MacVicar, MFL

Handouts: Agenda, draft paper from R. Kadlec entitled "The Disappearing ENR Phosphorus", e-mail from W. Walker dated 1/4/99.

Objective: To solicit input from the public on parameters and issues that influence the design of STA 3 / 4.

Background: The participants of this meeting volunteered to discuss STA 3 / 4 design issues with the District and its consultant. This is the second "mini" STADG meeting referred to at the October 22, 1998 regular STADG meeting. This meeting and another held on December 7, 1998 were scheduled.

1. **DELIVERABLES.** Randy Bushey responded to an inquiry from the 12/7/98 meeting regarding public review of deliverables. The problem is that there are a multitude of deliverables (83 of them) in the first phase of design, and, in order to remain on schedule, review periods are not extensive. Reproducing and mailing documents will consume too much of the allotted review time. Randy said that he is preparing a "web board" similar to the process used in the review of the Interim Report. Notification would be issued upon posting, and it would be accessed via the internet. Comments could be sent electronically.

Tom MacVicar said that would be acceptable if it remained viewable for some time following the review period. Angie Dinkla said it could be prepared as "view only ". Some of the material will be extensive - Randy will check on the

capacity of the process, and advise the group as to how long items are likely to remain accessible.

2. **FLOWS / LOADS.** Jim Kunard reviewed Bill Walker's e-mail. Bill sent it for the District, Burns & McDonnell and the assembled group to review, but could not attend the meeting. Jim selected the fourth bullet to start general discussion. (Jim welcomed any comments to all of Bill's submittal, either today or at the next meeting.)

*Fourth bullet:* Galen postulated that Bill is suggesting that, since the 236,000 AcFt/year of Lake Okeechobee water releases are unlikely to be able to be physically delivered to the STA (due to lack of conveyance capacity), that the District consider easing the burdens on STAs 1W and 2 with the capacity set aside for lake releases.

Galen said that the 236,000 AcFt/year are in the Conceptual Design (CD) for supply to STA 3 / 4. It was back-calculated from the capacity of the Toe of the Boot. Galen said that the increase in flow to the Everglades Protection Area (EPA) was calculated at about 26% - he can't say how the figure of 28% got in the Everglades Forever Act (EFA). Bill's e-mail seems to say that the amount that is set aside in the Restudy (a 19% increase per alternative D13R) cannot be counted on at this time either, and the District should consider not including that water in design computations. Max Day agreed with that, and added that the 19% in that alternative is not strictly lake release. He said it was premature to use the Restudy results. Gene Duncan said that it is possible that the Restudy will never get approval.

*Fifth bullet:* Bill indicates that the Interim Action Plan (IAP) flows were ignored in the mediation and the CD, and said that they should be included now. Galen said that compliance with the IAP began in 1986 (it was enacted in 1979). 20% of the flows (representing 25% of the phosphorus load) were to be sent to the lake, and 80 % of the flows (with 75% of the Phosphorus load) were to be sent south to the water conservation areas (WCAs). Tony said that there has been an increase in efficiency in sending the flows south since then. Galen said that the more water sent due to the IAP, the more BMP makeup water is needed.

Tom said that the IAP reduced flood protection for the Everglades Agricultural Area (EAA), and asked that the District look at increasing STA 3 / 4 inflow pump capacity to offset it. He said he feels that the flood protection is only 7/16" / day in the north part of the basin now, and will be less due to addition of the 298 District diversions. Tom said he would try to suggest ways to do that, using both Miami and North New River Canals.

Mike Zimmerman said that, at S-4, water is still pumped to the lake, and asked if it was feasible to use it to satisfy the 28% increase statement in the EFA. Galen said that some of it is, via the Industrial Canal (in the South Florida Conservancy

District, or SFCD). He said it was counted in the "26% increase" recommendation

Galen said that his draft deliverable on flows and loads is due in February 1999.

3. **ENR DATA USE.** Bob Kadlec asked if Galen had received Bill's 12/8/98 submittal [Author's note: This submittal consists of data from Walker's website, such as inflows/outflows, BMP assumptions, sensitivity to settling rate]- the answer was yes. Bob then led a discussion on ENR data with the basic questions of: What use is there for the data? When can it be used?

Galen said that, for now, he would use the rainfall (atmospheric deposition) and evapotranspiration data. The Interim Report states the District position. The footprint will be established based on a 10.2 m/yr. settlement rate.

Bob (and Bill, per his e-mail) would like to see B&M consider the function of Cell 4 of ENR. It could be used for internal design, forecasting and economic ramifications. He felt that the District should be accumulating data from other Florida wetland projects like Bony Marsh, Titusville, and Ironbridge. He feels that any progress made toward concentrations lower than 50 ppb, can only help reduce Phase II costs. Bob said that Bill Walker has done analyses of individual cells and has recently updated it (to be available soon). Perhaps we could mimic the hydrology of Cell 4 in STA 3 / 4.

Mike Chimney said that, in isolation, Cell 4 does well, and the Submerged Aquatic Vegetation (SAV) test tanks, too. He cautioned about using Cell 4 data without recognizing its connection to the rest of the ENR system, however.

Bob said that changing hydraulics for an operating depths related to SAV functions would come at a price, but it might be worth it to cut into the cost of meeting the Phase II goal. (SAV methods require a higher maintained depth, which influences construction.)

Tom Kosier said that you would have to be able to control the outflow elevations, as the inflow is driven by rain. Galen agreed that the outflow works would look different to control the stages.

Bob asked if we could all agree to bring "to the table" all ENR data we individually feel is useful, to the next meeting. We could discuss how what we bring could affect the treatment process, and how it interacts with hydrology and hydraulics. It would be provided to Burns & McDonnell for consideration for their February deliverable on flows and loads. Jim will make it an agenda item. Tony asked when we would look at the flow record - the answer was that it would be in the February deliverable. Mike Chimney asked Galen to have his subconsultant, Bob Knight, contact him.

4. **SEEPAGE / WATER BUDGET.** Bob drew the group's attention to page 2 of his report. The middle data list shows inflows of 771k AcFt, and outflows (except seepage) of 566k AcFt. Bob said that the amount lost to seepage in the four year water budget is 204k AcFt. He said that it carried with it an unknown amount of phosphorus. On page 3 of his report, he summarizes how ENR's phosphorus removal ability can be viewed two different ways. He said that if seepage is counted in phosphorus removal, then we could say ENR removed 82% of it. If we do not count it, ENR removed between 56% and 75%. He said he would like to accept it; if so, we would acknowledge that it is gone, take credit for it, and find ways to enhance that phenomenon. It has been happening under the WCAs for a long period.

Gary asked if other agencies have issued opinions on the issue. Bob said that they have considered it informally. The District has not interfaced with Florida Department of Environmental Protection (FDEP) groundwater staff. Tom MacVicar said it would be similar to regulating the accumulated effect of all the septic systems in Dade county on the aquifer - very hard to do and not practical. Mike said it would take putting in wells to somehow check the quantity of seepage and quality of it, from the WCA, and comparing it with losses around the ENR.

Jim Kunard said that, from a report done by Hutcheon for STA 1W, the District feels it has captured virtually all of the surface water seepage with the extensive works we have designed and are now constructing (seepage canals and pumps). We can now only monitor for what deep seepage affects might have on surface waters.

Bob said that, if we wanted to take advantage of the phenomenon, we would not seal the limerock with muck - we would strip it so it would leak more. Additionally, we would not return the seepage.

Mike Chimney said that we will eventually know what is coming through the L-7 levee from a USGS report. The report is due in 6 months, but the transect data could be available sooner. [Author's note: Mike now advises that early delivery of transect data is unlikely.]

Mike Zimmerman asked about STA 3 / 4 and its relation to WCA 3A. Randy said that there is no data on seepage there, but that the end of the STA closest to the WCA is the "clean" end of the treatment, and there is a 300' wide FP&L easement between the STA and the WCA.

Jim asked where deep seepage goes, in general - Galen said that it might be taken southeast by the local aquifer. The geotechnical analysis will answer some of those questions. There will be 5 wells for short term aquifer performance testing (APT), and one will be selected for a long term test. Galen said B&M would look at deep and perimeter seepage in a June/July 1999 timeframe.

## **5. WATER QUALITY MODEL.**

This is discussed in the Interim Report. Zaki Moustafa said that, we can't apply this to the project, because, although the hydrologic part of it is okay, he hasn't calibrated the phosphorus concentration part without having Phosphorus data available for STA 3 / 4. He said he was recalibrating ENR's model by the end of February, and will try to issue the recalibration report in March. Galen, Bob and Tony desire a copy of the report. Galen asked what tool was available for use in STA 3 / 4. The answer was that it can predict residence time, water surface elevations, and vegetation resistance. It can be run in 2 or 3 dimensions. It was developed for WCA 2A and ENR but could be applicable in other wetlands, if you know the interior configurations. It can be run with time as a variable. It takes the computer 2 days to run the ENR application for a 15 month period of record. It solves the Navir-Stokes equation. Zaki said it could be run with irregular patterns / configurations, but that he would need to establish the cells with his preprocessor. Galen said that even the perimeter of this STA is not set yet.

- 6. SUPPLEMENTAL TECHNOLOGY IN STA 3 / 4.** Gary Goforth said that the District is using various fora to offer a suggestion for incorporating a supplemental technology, including the STA Design Group. The concept is that, if a consensus is raised to use a certain supplemental technology, the District will implement it. Providing, of course, that all parties agree to accept whatever water quality it can deliver. There is not time to evaluate the available technologies (beyond doubt) if we are going to use one in this STA. The Environmental Community meeting will also be used to discuss this concept. Nick Aumen is arranging that meeting.

Bob referred the group to his draft paper on PSTAs (see the 12/7/98 meeting highlights, which suggested that use of PSTAs was premature). He said that, in general, all the technologies were in an early stage of development. He felt it did not make sense to use them yet, except perhaps microfiltration.

Tony said that would change the schedule. Gary said that adjustment would have to be accepted by all parties as well.

Bob said that we don't even know what concentration we would be asking the technology to reduce from, nor to what it should be reduced. Galen said that perhaps there is an obvious leader, on which that we could all agree to concentrate.

Bob said that we have developed a standard of comparison, and a process is in place to make this decision. Gene Duncan said that he approves of Sam Poole's initiative - progress over process.



Susan Gray said that there currently isn't sufficient information on the biological processes under investigation to pick one to move forward with. In addition, it is important to continue the research projects for biological treatment systems for at least one full year to assess the seasonal effects on performance - you just can't speed up biology.

It was suggested to perhaps discontinue chemical treatment options and redirect the associated resources. However, there are greater land issues related to other options, and presently, there is not much resource at risk.

Susan said that, in another year, PSTA and SAV may very well be advanced enough to make reasonable predictions on cost and efficacy. She said it was probably not prudent to go forward with incomplete or absent data.

Bob suggested that the "Griffin Property" (adjacent to L-5 at the southeast corner of the "Toe") not be designed into the STA, or perhaps delay it, as it has interesting features that may be more readily applicable to a supplemental technology than other areas.

Bob wondered aloud as to when everyone will think that enough time has passed to trust the treatment ability of ENR. He also said he felt it would be imprudent to go with a biological Phase II option at this point.

Gary said that the District will send copies of the draft Strategy for Achieving Water Quality Goals electronically to those who desire it. The sign-in sheet was sent around again to get e-mail addresses of those who want it. [Author's note: Randy Bushey has now forwarded these files.]

## **7. OPEN DISCUSSION.**

- a. Blake Sasse said that he would like the District to consider water supply to the Holeyland in the dry season. He said that, in the dry season, it is likely that there will frequently be no STA 5 discharge water, and that there is very little Miami Canal discharge planned right now from STA 3 / 4. He wants to know if more can be made available. Gary said that in the dry season, the water source is Lake Okeechobee, and that the ECP was not intended to always function in the dry season.

He also said that flow-through capacity is reduced now because the culverts are not working, resulting in stages being too high sometimes. The group asked Galen to consider flow through operation of Holeyland (Holeyland was ignored in the CD). Galen said that supply is considered in the Restudy - but Blake said GFC was not happy with the Restudy.

- b. Tony asked for an update on the National Pollutant Discharge Elimination System (NPDES) permit from the Environmental Protection Agency (EPA). Gary said that there is a meeting planned for 1/11/99 at FDEP's office from 1 p.m. to 5 p.m. Tony said it would be better to know what EPA is requiring before we get too far with STA 3 / 4. He suspects there are performance specifications in the conditions. He said that there is a difference between "never" exceeding outflow concentrations and meeting the 50th percentile - it could double the treatment area, or worse.
- c. Mike Zimmerman asked for more information on the notice he received from the Corps about the STA 3 / 4 permit. Gary said that, currently, STA 3 / 4 is not in the Corps permit. The District is trying to modify the permit so that it is included. During the early part of the design effort, we are looking at alternatives to satisfy the Corps. Public meetings are to be set; the notice covers the first one. (Gary said that the notice reads 1/22/99 - but it is being changed - watch your mail.)

Bob asked if there would need to be an amendment to the Programmatic Environmental Impact Statement (PEIS). Gary said that if B&M's reports indicate that changes are minor, it may not need to be. Tony asked if the changes to the outflow works would cause it to be amended - Randy said that the main concern there would probably be changes to the footprint of the STA.

Tony asked how the state permit process was coming. Gary said that, so far, it appears that EPA will issue the permit for STA 1W, and FDEP the remainder. It is a 5 year permit, and contains a 10 ppb limit in 2006, but it provides for rulemaking in the interim to set the agreed upon limit.

Gary said there is a Governing Board workshop item on the NPDES situation in January.

#### ACTION ITEMS

Randy Bushey

- 1. Complete preparation of the "web board" for public review of contract deliverables. Advise of details on how to access and use it. Describe notification routine. Capacity of the system and duration of items posted on it.
- 2. E-mail the draft Strategy for Achieving Water Quality Goals to those requesting. [Done.]

Tom MacVicar

- 3. Provide suggestions on increasing flood protection he feels was lost due to the I.A.P.

Jim Kunard

4. Create a January Agenda Item for providing all available ENR data to Burns & McDonnell.

Mike Chimney

5. Provide the USGS data on L-7 seepage.

Zaki Moustafa

6. Send recalibration report to Jim Kunard, Galen Miller, Bob Kadlec and Tony Federico when available.

Galen Miller

7. Review Holeyland water supply in the dry season per Task 2.7 of the Scope.

All recipients of these notes

8. Review and comment on Bill Walker's 1/4/99 e-mail.
9. Bring any data related to ENR that you want the District and its consultant to consider.

MtgSTADG199

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS

January 22, 1999

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Linda McCarthy, FDACS @ SFWMD
Bill Walker, repr. USDOJ	Galen Miller, Burns & McDonnell
Jennifer Jorge, SFWMD	Tracey Piccone, SFWMD
Tom Kosier, SFWMD	Randy Bushey, SFWMD
Tony Federico, MFL	Blake Sasse, GFC
Susan Gray, SFWMD	Zaki Moustafa, SFWMD
Craig Tepper, Seminole Tribe	BJ Kattel, GFC
Alex Perez, SFWMD	Neil Larson, SFWMD
Susan Coughanour, SFWMD	Bruce Arrington, USFWS
Ana Marshall, SFWMD	Mike Zimmerman, ENP
Steve Gong, CH <sub>2</sub> MHill	Bob Knight, CH <sub>2</sub> MHill
Mike Chimney, SFWMD	Shawn Komlos, National Audubon Society
Gary Goforth, SFWMD	Laura Brandt, USFWS (Lox NWR)
Fred Rapach, PBCWUD	John Bretz, Sverdrup

Handouts: Agenda, 1/20/99 Fax from R. Kadlec, Corrections to 1/5/99 Meeting Highlights

- 1) **GENERAL INFO.** Jim Kunard said that since the full group met last October, the District has been very busy. As agreed then, two "mini" STADGs were held (12/7/98 and 1/5/99) to discuss technical details in greater depth. Highlights of those meetings and associated correspondence were mailed to all STADG members. Input is welcome.
- 2) **CORRECTIONS TO 1/5/99 HIGHLIGHTS.** Jim Kunard acknowledged some corrections to the previous minutes requested by Bob Kadlec and Blake Sasse. No further comment was received.
- 3) **NEW U.S.FISH & WILDLIFE SERVICE REPRESENTATIVE.** Bruce Arrington introduced Dr. Laura Brandt, who has accepted the position with the USFWS that Su Jewell held until she was promoted last year. Laura will participate in the STADG for that organization.
- 4) **STORMWATER TREATMENT AREA STATUS UPDATES**

**A) STA 1E.**

The Corps will be present at the next meeting. The District would like to coordinate the next STADG with the Public Meeting scheduled by the Corps for

the STA 3 / 4 "404" (dredge & fill) Permit. It is scheduled for 2/18/99. The group agreed to meet on that day, in the afternoon.

**B) STA 1W:** Jim said that the project is proceeding well, but is about 19 days behind schedule at this point. The Cell 5 completion milestone is still intact, however. The contractor has been asked for a schedule recovery plan. Portions of Cell 5 will be flooded soon.

**C) STA 1 Inflow & Distribution Works:** Jim said that this project is on schedule. The mechanical aspects of Structure G-302, which supplies STA 1W, should be completed next week. The canal connecting G-302 to STA 1W is being constructed now. G-301 mechanical work is underway, also - it is expected to be functional in March. The cofferdams are in place for G-300 (east side of Refuge) and dewatering has begun for the foundation work. The separation levee is within 1 lift of completion.

**D) STA 2.** Jim said that STA 2 is advancing well - slightly ahead of schedule right now (29 days). Work is now occurring in the Supply canal and its associated seepage canal. Some work disruptions are expected along the supply canal, as some fly rock from blasting winged an FP&L transmission line recently and caused some minor damage, and also some due concern by FP&L. The weirs on structures G-332 and G-334 are being formed.

G-337 (seepage pump station) is well out of the ground now. Structure walls are being cast, the discharge bay is complete, and flap gates are being hung.

The S-6 Diversion works should be bid next month.

**E) STA 5.** Jim said that this STA was issued a certificate of Substantial Completion near the end of December - right on time. All 4 cells are flooded at this time, so startup has commenced.

Tony Federico asked about the status of monitoring, so that start up can be assessed. Tom Kosier said that discussions are underway, but that there is no permit in place yet to allow discharge. Jim said that water quality monitoring devices have been installed at the four inflow points at the L-3 canal. Tony requested a copy of the draft operation plan for the STA, and the identity of the database keys for the WQ data. Gary Goforth said that whether NPDES permitting is needed for this STA is still uncertain. The Operating permits required from the Florida Department of Environmental Protection (FDEP) are in process, and the Notice of Intent is expected in February. A draft plan for startup has been submitted to the Army Corps Of Engineers (ACOE).

Bill Walker asked if the plan included handling the entire C-139 basin - Gary said it did. Bill said that as a part of Rule Development for the C-139 basin, he would provide a comprehensive analysis of historical data (about March 1999).

Craig Tepper asked when it was expected that information on the operation of structure G-406 would be available. Galen said he was responsible for a report which will be probably be available at the next STADG meeting. He said G-406 would be operated to prevent reductions in flood protection. Craig asked to be kept informed of the availability of the report.

The District is working hard to resolve the permit / monitoring issues so that discharge is not delayed. It is expected that 4 consecutive weeks of reduced phosphorus levels near the discharge structures will be required.

Team Land is working the discharge canal. It has a late spring completion timeline.

**F) W.WCA 3A Hydropattern Restoration (Part 1).** The superstructure of the G-409 pump station is under construction. At G-404, the cofferdams are now in place and foundation work is underway. Clearing of the L-5 levee has also started. The south L-4 levee breach is in this contract, as well as the addition of gates to G-357 (culverts at the Miami canal).

**G) Rotenberger Pump Station.** G-410 is planned to be bid this spring. It is a 240 cfs installation. Gary said that a period of 1 year of rainfall driven operation for Rotenberger is required per the ACOE permit. After that, an operation plan will be worked out before pump operation can commence. He asked Blake, Tom and Neil to coordinate on what information to collect in this time period.

**H) STA 6.** Tom said that the District's computer system trouble has prevented him from accessing recent reliable performance data. Contact Linda Lindstrom for more information.

**I) Outflow Pump Stations G-310 and G-335.** The base slabs (very impressive 5' deep pours) for both pump stations are underway, with G-310 about a month ahead. Both stations are somewhat behind schedule at this point (8 weeks for G-335, 4 weeks for G-310), but it is still early in the project and time should be regained.

**J) S-5A Diversion Works.** Jim reported that IT Corporation was awarded this project. They have begun mobilization, and are preparing their progress schedule, early submittals (like blasting) and their schedule of values.

**K) Program Oversight Team.** Alex Perez reported that the Oversight team made site inspections this week. Overall, the project is doing very well, with less than 1% increases in change orders during construction so far, overall. (There is relatively little claim activity.)

5) **STA 3 / 4.**

Randy Bushey said that the Notice to Proceed was issued to Burns & McDonnell on December 11, only 1 day after the Governing Board approved the contract. Activity commenced immediately, and the aggressive deliverable schedule developed during contract negotiations was begun. Randy reported that the first one, the draft report on Flows & Loads, has been delivered. Persons wanting copies of the report put their names on a list sent around to the group. Another report on the conveyance capacity of the North New River and Miami canals is underway, as well as horizontal and vertical surveying and geotechnical work. The District will receive aerial maps, including false color infrared images for vegetation mapping. February should see the start of the soil investigations for seepage (Aquifer Performance Tests, or APTs). This work should be completed by June and will be a STADG agenda item. Bill asked how the footprint could be locked in sooner than that if the seepage data is not available. Galen said that the footprint is based on the Everglades Forever Act (EFA) - it is expected that internal works will be affected by seepage data. That effort will occur later in the year.

Tony asked about the overall project schedule, including construction. Randy said that the District is going to try to adjust the current schedule so that full operation can occur on 10/1/03, not just completion of the wetland features. Jennifer Jorge said that startup would occur some months before then, and that the contractor will be encouraged to use STA interior lands for dewatering to encourage phosphorus leaching and startup vegetation growth where feasible while still under construction (like we are doing now on STA 2). This would shorten the STA startup time upon completion of construction. Randy said that this schedule acceleration, however, would increase the project cost, so it is going to be discussed at the Joint Legislative Committee on Everglades Oversight (JLCEO) in February. A decision should be made this spring. *[Author's note: This was bumped off the JLCEO agenda for February.]*

Alex said that the Talisman land purchase and other project events have also affected cash flow.

Jennifer asked when the next project construction estimate was due - Galen said it was due next winter.

Jim said that, in general, the Talisman Land Acquisition has taken 50,000 Ac +/- of land, scattered in the EAA, into public ownership. Generally, it has been or will be traded for lands just north of the WCAs which are considered more geographically suitable for environmental restoration and other uses. Apparently, there will be lease back options on some lands for a number of years. Persons wanting copies of the Terms of Agreement and map (if available) put their names on a list sent around to the group. Some of the land is within the GDM footprint of STA 3 / 4.

Randy said that work has begun on the pump station concepts and on the treatment system parameter deliverables. He said that the "Web Board" is being developed (similar to the Interim Report review procedures) to make the many deliverables quickly accessible.

Bob Kadlec's fax about Manning's coefficient ("n") was discussed (see attachment). The use of a variable "n" as opposed to a steady value of 0.8 (in the GDM) has already been used in other STAs, and will be used in this one.

Randy and BJ Kattel reported that duck-hunting season is over, but that snipe season is still underway, through 2/10/99. Surveyors / geotechnical personnel should be aware.

Bill Walker asked if the new lake release schedule was considered - Randy will get this data and forward it to Burns & McDonnell.

Tony requested a copy of the B&M contract. He also asked when an evaluation of expected performance was due (answer: November '99), and if he could review the sensitivity scenarios in advance (answer: yes - early summer time frame).

Neil Larson said that the ACOE public meeting scheduled for 1/22/99 has been deferred to 2/18/99 (5 - 7 p.m.). The STADG agreed to arrange our next meeting for that day also, in the afternoon.

Bob Knight gave a presentation on the Treatment Systems Parameters Task report he is working on. He is working with CH<sub>2</sub>Mhill on it, and it is due to the District on 2/13/99. He said that he is looking at other created wetlands in Florida (as recommended in the recent mini-STADG meetings). He cautioned that his presentation materials are still "draft". He said that the existing model uses plug-flow hydraulics, and that tracer-test results help determine flows and mixing. He said the current model shows that the achievable phosphorus concentration is zero, but actually, there is some minimum level (he called it "C-Star"). The settling rate (variable "k") in ENR was discussed, and comparisons were made between the east and west flow paths. Galen said that because the easterly profile is influenced by refuge seepage, and the westerly one is influenced by seepage losses, assumptions on "k" become problematic. Bob said that the ENR data is rather "noisy" - and Tony suggested that grab sampling might be less so.

Bill said that there is only one pump operating now in the ENR supply canal, creating a possible low-flow test. Mike Chimney and Tom Kosier felt it might be worth looking into.

Fred Rapach asked how long ENR records have been available for now - the answer was 4 years.



Bob said that no decision has been made yet as to how to deal with seepage affects on the model.

Bob said that residence time could vary even in very even-flow conditions. He reported that the Lakeland wetland is short-circuited substantially - any kind of channelization takes away STA effectiveness.

Bill advised that his computations are available: "Cell Mass Balance (1/8/99)" - Jim, Tony and Zaki Moustafa requested copies. Zaki noted that the ENR culverts are closed at times.

Galen said that the treatment parameters will be decided in the next 3 - 4 months, but that  $k = 10.2$  m/yr would be used to size the STA. The interior works should benefit from the evaluation, however.

Bill asked what assumption was being made on BMP performance. Galen replied that B&M would consider variable performance in the treatment predictions.

Bob and Gary said that a "lesson learned" item would be to utilize existing agricultural canals perpendicular to the flow, as these transverse "deep" zones seem to enhance performance. This would also reduce degradation costs. Existing adjacent muck berms might cause short circuiting, however, and do need to be degraded somewhat.

## 6) **HOLEY LAND ISSUES**

Blake Sasse said that the items listed are related to his letter to the District last summer. Jim said the District used the letter in the generation of the Statement of Work for the B&M contract, but would also shortly respond in writing.

**a) Flow-through regulation:** Blake said that, although the outflow culverts have been blocked off recently, GFCs desire is to eventually return to a flow-through operation. They would be interested in receiving STA 3 / 4 outflow in the dry season if it were available.

**b) Toe of Boot analysis:** Blake asked to be kept informed of the analysis that would look at removing the Toe of the Boot from STA 3 / 4. He said that other agencies might be concerned should it be left in, such as FDOT and the ACOE, as it was included in roadway construction mitigation agreements.

**c) Phosphorus standard.** Blake cautioned that a different "final" standard might be enacted by FDEP for the Holey Land than the STAs. This may have unexpected affects. There are parts of Holey Land (also Rotenberger and some Indian Lands) that are classified as Outstanding Florida Waters (OFW) - lands bought under certain state programs caused some unusual land designations. There are likely to be no physical barriers between OFW and non-OFW land.

Susan Coughanour said that the exact boundaries might be available from the District's GIS program through the Planning Department, or through legal descriptions via Joyce Rader in the Office of Counsel. Blake said he would look for a map and provide the section identifications in WCA 3A.

Galen said he needed the District to provide the current Holey Land Regulation schedule. Blake said that the 1990 schedule is "in place" but the 1995 schedule is operating.

**d) Seepage.** Blake advised that it might be a good thing to review pump station G-200 phosphorus records to evaluate the seepage water quality. Tom Kosier suggested contacting Linda Lindstrom (WRE).

**e) Water availability.** Blake asked the District to consider providing untreated water in the dry season, if available, and if treated water is not available.

**f) Recreation.** Galen said that there would likely be extra fill from the L-5, should it be decided that it could be used for extra parking or recreational enhancements at G-201. Blake also needs to know when the L-5 levee will be closed so as to notify the public.

- 7) **MISCELLANEOUS.** The next meeting is tentatively set for February 18, 1999, in the afternoon.

#### ACTION ITEMS

Jim Kunard

- a) Add ACOE update on STA 1E to the February agenda. (*due 12/18*)
- b) Provide copies of the Flows / Loads draft deliverable and the Talisman "Terms" document(s) & map (if available) to those on the sign up list. (*due 2/5*)
- c) Respond to Blake Sasse's letter. (*due 2/15*)

Rich Virgil

- d) Provide the WQ data base keys / identities for the STA 5 monitoring stations to Tony Federico. (*due 2/5*)
- e) Assist Neil Larson, Tom Kosier and Blake Sasse to develop the monitoring needs for the 1 year rain-driven evaluation of Rotenberger. (*Rich to set schedule*)

Bill Walker

- f) Provide analysis of historic C-139 basin flows/loads to Randy Bushey and Galen Miller when available from his Rule Development activity. (*due in March*)
- g) Provide Cell Mass Balance (1/8/99) computations to Randy Bushey and Galen Miller. (*available now at the walker website*)

Galen Miller

- h) Complete the G-406 operation report and forward to Rich Virgil and Craig Tepper. (*due 2/18*)

Randy Bushey

- i) Continue developing the STA 3 / 4 review Web Board. (*due 2/18*)
- j) Get the Lake Okeechobee release schedule and forward to Galen Miller. (*due asap*)
- k) Provide Tony Federico a copy of the Burns & McDonnell Design contract. (*due 2/5*).
- l) After receipt of Blake Sasse's data, determine whether more info is needed from Planning and Office of Counsel regarding the OFW issues in the area of STA 3 / 4.
- m) Check with Linda Lindstrom about WQ data at the Holeyland pump station - determine if it is useful in seepage considerations. (*due 2/18*)
- n) Advise Blake Sasse as to when the L5 levee will affect recreational access. (*due 2/15*)
- o) Work with Tom Kosier in evaluating the one pump flow situation in the ENR supply canal to see if it can be used as a STA 3 / 4 design tool. (*due 2/18*)

Blake Sasse

- p) Provide OFW map and identify OFW sections in WCA 3A. (*due 2/18*)
- q) Provide the regulation schedule(s) to Randy Bushey and Galen Miller. (*due 2/18*)
- r) Assist Tom Kosier, Neil Larson and Rich Virgil to develop the monitoring needs for the 1 year rain-driven evaluation of Rotenberger. (*Rich to set schedule*)

Tom Kosier

- s) Kindly assist Randy in evaluating the suggestion to use the one pump flow situation in ENR supply canal as a tool for using that data in STA 3 / 4. (*due 2/18*)
- t) Assist Blake Sasse, Rich Virgil and Neil Larson to develop the monitoring needs for the 1 year rain-driven evaluation of Rotenberger. (*Rich to set schedule*)
- u) Provide a copy of the Draft startup plan generated for the ACOE to Tony Federico. (*due 2/15*).

C: File (w/atts)  
STADG list

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN GROUP  
MEETING HIGHLIGHTS  
February 18, 1999

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Linda McCarthy, FDACS @ SFWMD
Ron Bearzotti, SFWMD	Galen Miller, Burns & McDonnell
Jennifer Jorge, SFWMD	Tracey Piccone, SFWMD
Mariano Guardo, SFWMD	Randy Bushey, SFWMD
Kenneth Cecil, MFL	Blake Sasse, GFC
Susan Gray, SFWMD	Max Day, SFWMD
Gary Paign, FDEP	Temperince Bennett, FDEP
Alex Perez, SFWMD	Neil Larson, SFWMD
Susan Coughanour, SFWMD	Bruce Arrington, USFWS
Jim Sturgis, SFWMD	Mike Zimmerman, ENP
Paul Moczynski, ACOE	Christopher Smith, ACOE
Mike Chimney, SFWMD	Trent Ferguson, ACOE
Gary Goforth, SFWMD	Laura Brandt, USFWS (Lox NWR)
Howard Ehmke, SFWMD	John Bretz, Sverdrup
Andre Cadogan, SFWMD	Ed Brown, ACOE
Richard Bray, FDEP	Tom MacVicar, MFL
Tom Johns, SFWMD	Bill Malone, SFWMD

Handouts:     Agenda

- 1)     **GENERAL INFO.** Gary Goforth narrated a 15-minute video of the Everglades Construction Project (ECP) components. The videotape was an aerial view of each major project element at its current state. Copies of the narrated video are available to interested parties on the District's web page, or from ECP staff
  
- 2)     **STORMWATER TREATMENT AREA STATUS UPDATES**
  - A) **STA 1W.** Jim Kunard reported that 70% of the disking in Cell 5 is complete, and the SE corner is flooded. The G-304 structures (gated culverts from the Inflow Canal) will be operated intermittently to flood the cell. The wetland completion is due by contract in March.
  
  - B) **STA 1 Inflow & Distribution:** Jim said that permanent power will be available at G-302 (gated water control structure feeding the Inflow and Everglades Nutrient Removal (ENR) Supply Canals) in about 2 weeks, and gate testing will commence. Excavation of rock is underway at G-300 (gated water control structure on the L-40 borrow canal) .

**C) STA 2.** Jim said that the second lift in parts of the perimeter levee are underway. The weirs in G-332 and G-334 are complete (outflow water control structures for Cells 2 and 3), and the contractor is working on the bridges now. Most of the canal work is completed, except for the Supply Canal, where the contractor is working now. The headwalls on the cell inflow structures are being constructed, as well as the outflow structures in Cell 1. Project is about 65% complete overall

G-337 (seepage pump station). The roof is now on, and roof hatch details are underway. The facility is about two weeks away from delivery of the major mechanical systems (pumps, generator, and rakes).

The **S-6 Diversion Works** is advertised for bids now.

**E) STA 5.** Tom Johns said that commercial power was now on site and that final tie-ins were being made. Gilbert Southern's contract is being closed out - they are working their final punchlist now. Susan Gray said that startup monitoring is being planned. Once initiated, there will need to be 4 consecutive weeks of results showing that outflow quality is better than inflow. There is no permit yet, however.

Tom said that Team Land should achieve Substantial Completion in April on the STA 5 Discharge Canal.

**F) W.WCA 3A Hydropattern Restoration (Part 1).** Foundation work on both the inflow and discharge bays of pump station G-404 is underway. On G-409, the discharge piping is being constructed.

**G) Rotenberger Pump Station.** G-410 is still in drafting. It is being designed by the District's Construction and Land Management (CLM) department.

**H) STA 6.** Ron Bearzotti said that the first annual report is due in April. The project seems to be well in compliance.

**I) Outflow Pump Stations G-310 and G-335.** Tom Johns said that foundation work is still underway. Harry Pepper & Associates (HPA) is somewhat behind schedule. The two pump stations are staggered in schedule, with G-335 following G-310. HPA. Reports that they will work double shifts during the mechanical installations to make up time.

**J) S-5A Diversion Works.** IT Corporation has dewatered a several thousand foot long reach of canal near the confluence of the Ocean and Hillsboro Canals.

**K) 298 Districts / Closter Farms.** Jim said that peer-review of 298 District plans is coming soon (East Beach and East Shore Water Control Districts). Closter Farms is nearly ready to bid but is awaiting their ACOE permit.

- 3) **STA 1E.** Paul Moczynski, U.S. Army Corps of Engineers (the Corps), introduced Chris Smith, who described the latest details and status of the STA 1E design. Chris said that the Corps has only made 3 significant modifications to the Burns & McDonnell GDM:

- Added the 725 Acre Distribution Cell.
- Divided Cell 4 into 4 North and 4 South.
- Truncated Cell 7 and changed its discharge to Cell 6.

Chris said that Inflow Pump Station S-319 (3,980 cfs) pumps into the Distribution Cell. From there, there are 4 flow paths: Cell 1 - Cell 2, Cell 3 - Cell 4N - Cell 4S, Cell 5 - Cell 6 and Cell 7 - Cell 6. It is the Corps' intent to design for normal stages at 1.25' over average ground elevations. There is also a seepage / Rustic Ranches subdivision stormwater pump station. It will discharge into Cell 4S. This station will have its own access road. The Discharge Pump Station, S-362, has a capacity of 4,200 cfs.

Chris described the general topographic features of the site. He said there is a large grade change in cell 1; it ranges from 10.5' - 24' (table 8 in the Design Documentation Report or "DDR"). The soil is also select material, so the Corps plans to regrade the site to approximately elevation 16.5' and use the resulting embankment for levees and other project uses. Likewise, Cell 2 ranges from 13' to 19.8' in elevation, so it will be regraded to elevation 14' +/-.

The flows will be distributed based on acreage. Land needs for the STA add up to 6,566 Acres (the effective treatment area is not yet established).

The Inflow structures are to be gated 72" culverts. The inter-cell structures are to be fixed crest weirs.

Chris said that the hydraulic modeling is a 2D run (lateral as well as longitudinal flow analyses) using a program called RMA 2. Primary input parameters are the friction coefficient (Mannings "n"), starting water surface elevation and flows. Chris showed a graph on the overhead of "n" vs. depth.

Chris displayed information on each cell. Highlights of his discussion:

- a) Cells 1 and 2: Low flows = 125 cfs (less than 1' deep), high flows = 900 cfs (1.5 to 3' deep).
- b) Cells 3, 4N, 4S: Low flows = 200 cfs (2 to 2.5' depths), high flows = 1450 cfs (3.5' to 4.5' depths). These cells are covered by a citrus grove. The Corps intends to chip them up and use the material for fill.

- c) Cells 5 and 6: Low flows = 165 cfs (1.5 to 2' depths), high flows = 1200 cfs (3.5 to 4' depths). Planted with cane currently.
- d) Cell 7: Terrain is very low - on the order of 11' ngvd. Excess fill will be brought here. Operation of this cell will be different due to its comparatively low elevation. Low flows = 60 cfs (3.5' to 4' depths), high flows (500 cfs) will cause stages to reach 6.5' deep. Chris said that operational decisions will need to be made, such as whether to use it as a buffer cell, or to operate it only when it is possible to maintain marsh-like conditions.

Mariano Guardo asked if the cells analyses were run independently- the answer was yes, due to node / element input restrictions. Mariano asked if the Corps checked for the effect on the friction coefficient in turbulent conditions when flows are low - Chris said they had not yet done that.

Mike Zimmerman asked if the Corps had used the 4 years of data on "n" values prepared by Bob Kadlec. Chris said he has the data, and that the n value curves he is using generally fit that data.

The next set of plans for the large pump stations are due in late summer.

A Periphyton STA (PSTA) technology test facility is still planned for the northeast corner of STA 1E:

- i) About 10 concrete lined cells. Overall dimensions about 10' x 100', with depths from 6" to 3 feet.
- ii) One day to 3 week detention times.
- iii) Ability to vary quality and volume of water inflows. Various bedrock combinations are also planned.
- iv) Approximate timing: Advertise for construction in April, start construction in June. Six month construction period. Commence operations in February 2000; 2 year research program.

Tom MacVicar asked about the cost - Ed Brown replied that it would be in the range of \$600,000, but they are scaling that back to the \$500,000 range.

Rich Bray, Florida Department of Environmental Protection (FDEP) said that he noticed that, in the DDR, the water quality part of the project seems to be weak or missing. Chris acknowledged that this aspect has not yet been worked out yet, but it will be resolved soon. Ed Brown said that the Corps is trying for good sheet flow, but that to them, this is primarily a flood control project.

Tom MacVicar asked when the regrading was planned and how long farming could continue. Chris said the Corps could advertise as soon as November 1999. Jim Sturgis said that the schedule shows a March 2000 Notice to Proceed. Under the Project Cooperative Agreement (PCA), certification that land has been

acquired is needed. The District is working with the Corps to see if farming can continue until award or the construction Notice to Proceed.

Mike asked if the latest water quality data was being used for the C51 canal. Chris said that the data is hard to use, that they are reluctant to use it, and probably won't. They do not want to reduce the size of the STA. Ed said that they will use it in the dryout analysis.

Mike asked about seepage. Chris said that both inter-cell and STA seepage will be evaluated. He then described the seepage handling system, from the canals back to the pump station at Cell 4S. Mike noted that if the seepage quality is good, why not send it right to the Refuge? Chris said that would be considered, but for now, it was headed back to Cell 4S.

Rich Bray asked who would operate the project - the answer was the District, but that the federal government would be involved in the operating plan.

Tom Johns asked about the cost. Paul said the cost was now estimated at \$210 million, with about \$60 million of that figure being land purchase.

Mike and Tom MacVicar asked about the PCA. Jim Sturgis said that it has not been concluded yet. Its current location is Washington, D.C. Of issue is the party responsible for future water quality. Paul said that the schedule is contingent upon execution of the PCA. The machinery contract cannot be awarded, nor can eminent domain filings be made. The Corps needs the land by November for the grading contract. If not all land is available, the Corps will consider smaller contracts to work with available land. Jim Sturgis said that the closing on the 1600 Acre parcel is currently planned before 4/15/99.

The Pump Station bids are coming at the end of the year, but still need congressional approval. Alex Perez asked if there was a contingency in place. Paul said there was, and that he has some flexibility with it.

Gary Goforth asked if the work depended upon annual federal appropriations - the answer was yes.

#### **4) STA 3 / 4.**

Randy Bushey gave a status report on this STA. The targets are in place for the aerial photography, and both geotechnical and survey work are now underway. He is taking advantage of the harvesting of fields within the footprint so as to minimize impacts to farming operations.

Staff held a day long pump station charette last week. The findings from the existing facility reviews were discussed, and system-level design premises established.



Two deliverables are in-house right now: The draft Inflows & Loads report and the draft Canal Conveyance Capacity report.

A computer has been secured for creating the project web board, so that any party can have electronic access. It will be set up shortly.

Tom MacVicar expressed interest in the alternative designs being evaluated. Randy said that simulation run information is coming from Cal Neidrauer soon (Hydrologic Systems Modeling Division), then Burns & McDonnell will look at configurations. The timeframe is mid-March for those evaluations. Tom suggested a mini-STADG meeting would be appropriate for this topic.

Randy said that the draft report is due in June. The District will then forward it to the Corps. Final conclusion on the STA configuration is January 2000.

#### **5) TALISMAN LAND ACQUISITION UPDATE**

Bill Malone updated the group with the latest information on this development. The Talisman land will be traded for other land in the southern portion of the Everglades Agricultural Area (EAA). In all, about 60,000 acres will be brought into public ownership. Bill showed a map. The heavy red line running generally east-west showed the northern boundary of the lands to be turned over to the government; it ranges generally from 2 to 4 miles south of Township 45, within Ranges 34 to 38 in the EAA. There is another category of "potentially available" land. Bill said that the land is generally not going to be available immediately. Most will be farmed through March of 2005, except Unit 2 of US Sugar, which will not be available until 2007. Bill said that these dates were coordinated with the Corps' Restudy schedule, and with STA 3 / 4 needs. Bill said there are financial impacts to the District involving 300 - 400 Acres with about four property owners: South Florida Grassing, Griffin, Florida Crystal remainders and US Sugar (STA 6-1).

#### **6) PERMIT ACQUISITION UPDATE.**

Gary reported that there is a public meeting tonight on the STA 3 / 4 Dredge & Fill permit ("404" permit) which will be needed from the Corps. The District is also counting on the STADG to disseminate information and encourage participation for this STA in support of its permits.

Gary said that permit applications for STAs 1W and 5 have been deemed complete for some time. (STA 2 is still in development, awaiting final S-6 Diversion Works Plans.) There is urgency, as STA 5 is now in startup, and the impoundments for both STA 1W and 2 will be ready this spring. The District desires to initiate at least low-flow operation as soon as the nutrient removal biology allows it.

Gary said that Governor Bush has requested time from the FDEP and Environmental Protection Agency (EPA) to enact legislation that will allow State administrative hearing officers (judges) the ability to authorize interim discharges from projects that are involved in administrative permit challenges, an option not currently available to the State. The ENR has been operating all its service time under a federal interim discharge authority while the EPA's National Pollutant Discharge Elimination System (NPDES) permit has been challenged.

Rich Bray (FDEP) said that he still cannot say what the final form of the permit will be nor from which agency the EPA's NPDES permit will be issued.

Tom MacVicar asked if the NPDES permit was still classified as "industrial" - Rich did not know. Rich said that the permits have entered the political forum and he cannot say for sure what form they will be in. He predicted that EPA will want to issue the NPDES permit. Tom asked if the District could merely withdraw its application and operate without an NPDES permit. Gary replied that, while that was an option, it might incur associated fines and civil penalties.

There remains a possibility that STA 5 will not need an NPDES permit because it serves solely agricultural runoff.

Tom asked if the STA 2 NPDES permit would be like STA 1W (Industrial) - Gary thought it would be likely that it would mirror the decision made on STA 1W. Rich said that the agencies are trying to develop a defensible, consistent rationale and strategy.

Rich introduced FDEP coworkers Gary Paign and Temperince Bennett. Gary will be taking Denise Miller's place (phosphorus standard development), and Temperince will be working in permitting under a 2 year grant from EPA. Rich said he basically remains a one man team. He is still trying to fill Jose Calas' place as FDEPs on-site representative to the ECP.

## 7) **MISCELLANEOUS.**

**A) SAV Technology.** Tom MacVicar said that there has been some recent discussion on the use of experience gained in Cell 4 of the ENR in the startup of STA 1W and 2. Cell 4 in ENR has had a very good history of nutrient removal (high settling rate). It is an intentionally open-water cell, populated mostly by submerged aquatic vegetation (SAV). Gary said it appears feasible for use in part of Cell 5 of STA 1W, and possible in Cells 2 or 3 of STA 2. He said that staff also believes that this is probably a good direction to take, and it could be implemented by making specific early operational decisions for the cells.

Based on experience from ENR Cell 4, one possible implementation plan would be to disk the soil and flood it quickly, followed up by prompt treatment of any

macrophyte growth with herbicide (which will take away competition for the SAVs).

Mike Zimmerman asked how the District would manage the deeper water - are control facilities in place? Gary said that the ENR Cell 4 has operated since 1994 at an average depth of around 2 feet, which is the same depth as the target operating depth in the STAs.

Gary said that there is a 25 acre cattail filter or "trap patch" the downstream end of Cell 4. Its purpose was to block floating algal masses from discharging during heavy flow events. He said this may not be necessary in other applications of SAV cells, based on observations in Cell 4.

Tom said it would be important to document that we are using this approach and utilizing the information ENR gives us. Tom suggested a smaller "SAV" task group might be justified.

It was noted that downstream of Cell 4, phosphorus concentrations go up, when combined with Cell 3 flows, which is puzzling. Seepage from the Refuge or stirring action from the pumps might be causing it.

Mike Chimney said that test cells are being utilized to explore this technology. The District has hired DB Labs, to summarize SAV / Limerock exposure concepts, and expects a report summarizing efficiency and economics. He said that, at 20 parts per billion (ppb), nature still has difficulty removing particulate phosphorus. Susan Gray said that the scope of the next phase is in development - she is facing scale-up issues.

Rich Bray said that SAV has other benefits besides a good settling rate, as it tolerates stage changes, and is good at adding dissolved oxygen to the water.

When asked about implementing SAV in STA 5, Gary mentioned that there remains a lot of scientific uncertainty around SAV (such as the affects of drying out), and at the present time, the District was proceeding with the development of emergent vegetation in STA 5. As more information becomes available, we can always adapt our management of the STAs to optimize performance.

**B) Next Meeting.** The next meeting will be timed around upcoming STA 3 / 4 deliverables, and is likely to be in April.

C: File (w/atts)  
STADG list

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN REVIEW MEETING  
MEETING HIGHLIGHTS

May 27, 1999

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Linda McCarthy, FDACS @ SFWMD
Laura Reilly, SFWMD	Galen Miller, Burns & McDonnell
Joe Schweigart, SFWMD	Tracey Piccone, SFWMD
Fred Rapach, PBCWUD	Randy Bushey, SFWMD
Dan Shalloway, SFRN	Blake Sasse, GFC
Susan Gray, SFWMD	Bob Knight, CH <sub>2</sub> MHill
Shawn Komlos, Nat'l Audubon	Frank Nearhoof, FDEP
Alex Perez, SFWMD	Neil Larson, SFWMD
Susan Coughanour, SFWMD	Bruce Arrington, USFWS
Chad Kennedy, SFWMD	Mike Zimmerman, ENP
Christy Kulich, Seminole Tribe	Gene Duncan, Miccosuckee Tribe
Bob Kadlec, rep. DOI	Karen Heald, SFWMD
Gary Goforth, SFWMD	Pete Rosendahl, Flo-Sun
Tony Federico, MFL	John Bretz, Sverdrup
Tom MacVicar, MFL	Tom Johns, SFWMD
Bill Walker, rep. DOI	

Handouts: Agenda, 5/11/99 Memo, STA 3 / 4 Alternatives Discussion Slides

**1) Meeting Style Clarification.**

Jim Kunard said that staff feel that the format of this meeting has been very useful to both the District and the public. In order to continue this way, the name of the meeting will be changed to a "staff design review" meeting, and will be run according to the memo that was handed out. This is so that all participants can continue to discuss the STA design issues outside of the meeting.

- 2) Web board.** Jim noted that the STA 3 / 4 web board is still not accessible. Randy Bushey said that if it were not available within a few days he would supply the information on a disk to anyone who asks.

**3) Everglades Construction Project (ECP) Construction status updates.**

Jim noted that the construction reports are on the web, so instead of the normal monologue about them, some of last month's photographs were viewed on the overhead projector. Following are questions / comments:

- A question was raised as to how deep the water was being held in Cell 5 of STA 1W. Victor Powell said that there is around 2.5' to 3' of water there. The source was generally Lake Okeechobee.
- A question was asked regarding water quality testing, and Frank Nearhoof said that there are 4 sampling stations in place.
- The schedules for the Outflow Pump Stations for STA 1W and 2 are both contractually established for August of 2000. Tom Johns said that the contractor is behind by about 63 days, but intends to double shift the mechanical work and is preparing a recovery schedule.
- Bob Knight asked what flows were going through the Everglades Nutrient Removal project (ENR) - Victor said it was about 200 cfs. Joe Schweigart reminded the group that the pump station contracts include consideration for early start up via temporary pumps (200 cfs per station) and also, should the smaller permanent pumps (2@100 cfs per station) be completed early, they could be used as well.
- Bill Walker asked what was being used to battle the fires. Rich Virgil reported that 3 pumps were being mobilized to combat the blaze in the Rotenberger Tract.
- Rich also said that the muck fire in Water Conservation Area 3A (WCA 3A) was put out. About 3000 acres were affected and about 3" to 4" of water was delivered to that area. Blake Sasse said the burned area was mostly in the northwest but that there was some fire in the southwest also.

#### **4) Advanced Treatment Technology Update.**

Susan Gray said that a solicitation for a Submerged Aquatic Vegetation (SAV) treatment system design consultant was underway. She said that the Periphyton Stormwater Treatment Area (PSTA) test site is up and running, and that Test Cell studies are going well. Susan said that Ron Jones is coming on board to work on test cells for PSTA, PSTA-SAV integration, and on scale-up issues.

Frank Nearhoof and Susan said that work on the Low Intensity Chemical Dosing technology is to be discontinued. Susan said that very high doses were needed to obtain a reasonable flocculation. Also, the flow rates we are facing are too high - the flocculent won't settle properly. Frank said that this method did not warrant the expenditure of scale up to building the flumes, and Susan added that due to the budget cycle, the time is right to make this determination. Frank also said that a final report on the effort to date is due this September or October. Bob requested to be copied on any information supporting the cessation of activity on this technology.

Susan said that the next meeting of the Advanced Treatment Technologies Initiative is tomorrow, 5/28/99 at 10:00 a.m. The one after that is June 16, 1999.

Bob Kadlec asked when the Chemical Treatment Solids Separation (CTSS) report was due, and Frank said it is not due until next year. The work plan is under development, however, and more information can be obtained from Jose Lopez (SFWMD). Susan said that the status of each technology is reported to its respective project manager on a quarterly basis.

## **5) STA 3 / 4 Update.**

Randy Bushey and Galen Miller made a presentation on the status of the project (see handout). Randy said that today, the alternatives will be discussed, and that in June, the alternatives will be analyzed and a recommendation made. Once a footprint is decided upon, internal configuration analysis will occur (over the summer).

Randy said that field data is coming in now (geotech, survey, mapping).

Galen Miller confirmed for Bill Walker that the water management model was run with the updated flows and loads, using the WSE regulation schedule for Lake Okeechobee, a 20% reduction in runoff volume from the EAA due to BMPs, and with the ECP in-place (but not reflecting Restudy works).

**STA 3 / 4 Footprint:** Galen said that the footprint is affected by both land issues and the method of outflow distribution.

All the land in the existing footprint (Conceptual Design as modified by the EFA) will be available in April of 2001, while lands north of there in the Talisman trade area will not be available until March 2005. (The EFA date for the STA is 10/1/03.) Some of the land northwest of the Holey Land just east of the Miami Canal will not be available until 2015 (Board of Trustees of the Internal Improvement Trust Fund, or BTITF), while other lands in that same area will not be available until 2007.

Although a separate STA 3 / 4 was considered (because of the long inflow and outflow canal work associated with a combined STA), it is not practical for several reasons, the primary one being land availability. Although the relative cost of separate STAs are projected to be a little less than the combined STA 3 / 4, the reduction in cost to use separate footprints is not so significant as to warrant the effort to undo and/or revise hard-won land agreements and the Everglades Forever Act (EFA). The agricultural community negotiated vigorously for farming rights in the Talisman trade. Outflow options that would be less complicated to construct with separate STAs, can still be accommodated with a combined STA. Tom MacVicar said that there are other reasons not to separate

the STAs. Galen said that the review has indicated that there is no major economic reason to proceed with splitting the STA.

It is included in Burns & McDonnell's scope to consider the Restudy's water management strategies as best as possible within the design of the project. Randy said that the project cannot fund Restudy items, however, and must operate well in advance of it.

Alternatives to be further analyzed, therefore, include only combined STA options.

The impact of various outflow options will be evaluated by District staff. The South Florida Water Management Model (SFWMM) will be rerun to compare with results of the Natural Systems Model (NSM). The SAWCAT model will be run to evaluate cattail impacts.

[Author's Note: The Everglades Phosphorus Gradient Model (EPGM) will be used instead of the SAWCAT model.]

Galen went over the main parameters and assumptions to be used to design the STA:

- Settling rate (k): 10.2 M/Yr. Based on the Conceptual Design, Interim Report and for conservatism in design.
- Footprint Area: 16,660 Ac per the modified Consent Decree.
- Inflow: 641,000 Acre-feet / year.
- Nutrient concentration: 118 ppb.
- Construction completion: 10/1/03.
- No bypass of flows in the 1979-1988 Period of Record.

Tom MacVicar asked if there were to be any new analyses on footprint size. Randy said that the GDM footprint would be used (also included in the consent decree), flexibility for Advanced Treatment Technologies would be included where possible, and that no other analyses were planned. Tom said that adjusting the settling rate didn't matter in the sizing of the STA, then, because the District is going with the legally created size.

Galen discussed the unit prices they developed for use in the analysis of alternatives. He said that the figures were based on Schedule of Value data from current construction projects (from ECP's Project Controls Division), increased by 20 % for contingency, and then escalated (approximately 10%). Therefore, the cost data being presented should be used for assessing relative cost only of broad alternatives. No attempt was made to evaluate the budget. No detailed quantity takeoff was performed - for instance, levee cost was estimated on a per mile basis, not on a per cubic yard basis. The cost of money was escalated to the middle of the scheduled construction period.

Bob Kadlec asked if the costs for the control structures included the option of remote control, and Bob Knight asked what capacity was used for the comparison. Galen said remote control costs were included and that the capacities were standardized at roughly 400 cfs. He said that the outflow structures considered in the cost comparison figures were the STA 5 structures.

Outflow options were then described. On the schematic diagram, Q1 represents flows to the west, Q2 represents flow to the east and Q3, to the south into Water Conservation Area 3A (WCA 3A). Alternative 3 approximates the results of Restudy alternative D13R.

Tony Federico asked if any of the options reflected sheetflow into WCA 3A. Galen replied that all alternatives with a Q3 component do, but the outflow target concentration of 50 ppb could violate anticipated federal (404) permit conditions for direct discharge to the area. Accordingly, the analysis does include alternatives which exclude sheetflow into WCA-3A. The Hydropattern Restoration (HR) aspects of the STA 3 / 4 project will have to stand on their own for 10 to 20 years, depending on how the Restudy work progresses.

Tony asked which alternate reflected the Conceptual Design (CD), and Galen said that although Alternative 4 is the closest one, no option reflects all the premises of the CD. That is because further analysis (GDM and later) has indicated that the water profile resulting from implementation of the CD would have caused staging of water in the STA to be too high. Bob Kadlec asked 'how deep was too deep', and Galen said depths would be in excess of 4.5'.

It was asked what Mannings value (n) was used for WCA 3A, and the answer was that the SFWMM used a variable 'n' like the STAs, but reduced due to sparser vegetation.

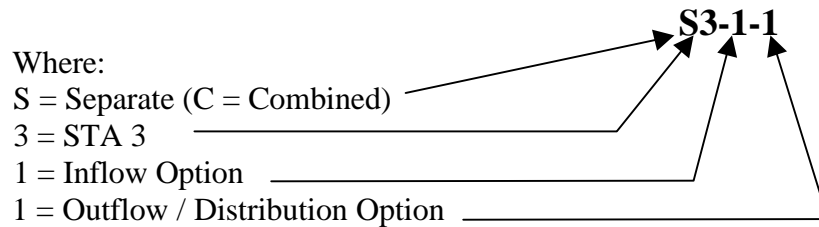
Bob Kadlec asked who was looking at the consequences of the HR alternatives, and Randy said that it was to be Luis Cadavid, of SFWMD's Hydrologic Systems Modeling (HSM) group. Gary Goforth added that the Programmatic Environmental Impact Statement (PEIS) methodology would be used, and SAWCAT analyses. The NSM run for the alternatives will be compared with the "No STA 3 / 4" run. This is intended to be done in the next 30 days or so.

[Author's Note: The Everglades Phosphorus Gradient Model (EPGM) will be used instead of the SAWCAT model.]

Bob Kadlec was concerned that the HR facilities might be passive features like levee cuts, but Galen said that, as shown on table 6.6, the structures will be remotely operable.



Galen said that there are 36 different alternatives that were considered. Sixteen of them included separate STAs. The labels for alternatives can be deciphered as follows. A typical alternative would have a label like:



Bob Kadlec asked whether the District would consider moving the STA northward, reserving the bottom 2 miles for Advanced Treatment Technologies? Galen said that the land is not available in the needed timeframe, reopening lease agreements would likely face stiff opposition, and the cost would increase on the order of \$10 - 14 million (canal costs, etc.). Gary said that moving forward would not preclude using SAV methods or other natural methods of nutrient removal, as internal modifications would still be possible. Bob Kadlec said he would like to know what the price tag would be to get to the 10 ppb outflow concentration level.

[Author's Note: Preliminary cost estimates will be prepared during the conduct of the supplemental technology investigations.]

Bill Walker asked what the topography was looking like, and Galen said the data in so far indicates that the elevations are slightly lower (0.5' +/-) than anticipated, in the general range of 9.5' ngvd. Pete Rosendahl asked if WCA 3A was generally higher or lower than that, and Galen said WCA 3A was higher. Galen also said that there is very little relief - the area is virtually flat (no problem with sheet flow!).

Joe Schweigart asked if there would be any more analysis of the size, and Galen said no. Galen said that there is too much uncertainty in the data to warrant changing this, and it must unquestionably operate (reduce concentration to 50 ppb) as required by law. Pete Rosendahl asked that his request be put in the record: Consider reducing the footprint acreage, removing 7 sections at the north, including the Toe of the Boot, and then look at the cost savings related to these items. Galen said that it is not even certain that the STA is big enough - in response, Tony said that, however, the bulk of the evidence indicates otherwise.

Bob asked if the topography was such that, if water in the STA were down to about 2', would that mean that the WCA 3A would be dry. Galen said that was likely. Galen then said that the minimum depth in the STA where it could still discharge was about 15" of water.

Galen talked about 3 of the STA 4 options (alternatives S4-1, S4-2 and S4-3). Pete said that it was not feasible to use Talisman nor Parker properties. Galen said that the land would not be available until March 2005 and after anyway, but a relative cost for separate STAs was generated anyway. (Galen reiterated that the cost data being presented should be used for assessing relative cost only of broad alternatives.) He said that, with the probable outflow features, the cost would range from \$131 to \$146 million. He added that there is also a chance that the capacity of pump station S-8 might not be enough.

Tony said that the analysis does not address sunk costs in land purchased to date that would not be used. Galen agreed - the costs presented are from this point forward.

Tom MacVicar said that separate STAs could possibly interfere with Restudy considerations. Randy agreed, and said that it could not be done "in a vacuum" - coordination would have to occur related to reservoirs, etc. There is simply not enough detail right now to address those issues. Randy said that the Restudy issues are being considered, but are not a determining factor - the District has no authority to act on Restudy needs. Galen added that some goals would still be mutual, however. For instance, widening the L-5 Canal to suit STA 3 / 4 discharges would also suit Restudy objectives to some degree.

Tom MacVicar said that the sunk land costs are not inconsequential - and the agricultural industry approved of the District's investment in the Mace property purchase (7,000 Ac +/-). Galen reiterated that there do not appear to be sufficient savings to pursue separating the STAs anyway.

Galen described the combined STA options. C-1-1 includes the Toe of the Boot, and C-1-2 uses S-7 as an inflow pumping station. C-2-1 excludes the Toe, and moves the north STA line to the place approved in the EFA (1 mile north of the CD line). Galen said that a possible glitch/disconnect was discovered: The "Talisman" line may not extend a full mile north of the CD north line (about 1/6 of a mile short?)

Alternative C-3-1 is the GDM footprint. It does include land not available until 2005, but conforms to actual farm drainage features.

Overall, combined STA relative costs range from \$132 million to \$166 Million (as compared to \$131 million - \$146 million for separate STAs). The \$132 million figure incorporates the Toe of the Boot, so the realistic low relative cost figure for combined STAs is \$138 million. At approximately \$10 million ballpark difference, it is worth going forward with combined STAs to avoid delays and other possible expenses. Tony concurred, and said that this cost difference is well within the uncertainty range for reopening land lease and land acquisition agreements, which he felt would dwarf \$10 million. Tony also said that legislative approval would not be timely.

As far as the inclusion of Toe of the Boot area goes, Tony felt that the Governing Board needed to make that call soon.

Tony asked if Alternatives C-2-2-4 and C-2-2-2 included refurbishing or upgrading Pump Station S-7 - Galen said yes.

Galen said that B&M was drafting the evaluation of alternatives at this time, and are currently preparing a treatment performance evaluation. No STA interior works changes have been considered yet. Randy said that we are closing in on the location, inflow and outflow option selection, then will move on to interior works evaluations.

Bob Kadlec said that when the District looks at internal arrangements, it should look for ways to enhance STA performance, so that the project will cut into Phase II liabilities. Galen acknowledged possibilities but expressed concern as to how those modifications would be paid for - they might be beyond current EFA scope for funding. Bob said that the policy makers should be advised. Randy said that the project design can consider "no added cost" considerations for Phase II efforts that might make the transition to Phase II easier.

**6. General Discussion / Set next meeting.**

Bob Kadlec asked for a discussion on STA 6 at the next meeting.

Mike Zimmerman asked for an update on the STA 1E DDR comments.

The next meeting was tentatively set for June 30, the day before the Advanced Treatment Technologies Initiative meeting.

Randy asked that everyone begin using the STA 3 / 4 web board. There is a comment area, and you can see other parties' comments, too. It can be accessed at the address provided, or by going to the District's website under: Major Projects, ECP, STA 3 / 4 Design.

C: File (w/atts)  
STA list  
New attendees

SOUTH FLORIDA WATER MANAGEMENT DISTRICT  
STORMWATER TREATMENT AREA (STA) DESIGN REVIEW STAFF MEETING  
MEETING HIGHLIGHTS

June 30, 1999

Attendees (per sign in sheet or observed)

Jim Kunard, SFWMD	Chris Cherniak, Brown & Caldwell
Laura Reilly, SFWMD	Galen Miller, Burns & McDonnell
Rich Virgil, SFWMD	Tracey Piccone, SFWMD
John Bretz, Sverdrup	Randy Bushey, SFWMD
Keith Jackson, SFRN	Bruce Arrington, Lox NWR
Shawn Komlos, Nat'l Audubon	Ken Dodge, LLW
Alex Perez, SFWMD	Neil Larson, SFWMD
Susan Coughanour, SFWMD	Ken Cecil, MFL
Ron Bearzotti, SFWMD	Mike Zimmerman, ENP
Sherry Scott, SFWMD	Karen Heald, SFWMD
BJ Kattel, GFC	Pete Rosendahl, Flo-Sun
Tony Federico, MFL	Jim Sturgis, SFWMD
Agnes Ramsey, SFWMD	

Handouts:     Agenda

**1)     Everglades Construction Project (ECP) Construction status updates.**

Jim Kunard noted that the construction reports are on the web. Recent photographs, however, were viewed on the overhead projector, and any questions were welcomed:

- a)     Pete Rosendahl asked several questions about the G-337 pump station. Agnes Ramsey said it is located just northeast of STA 2. The fuel tank in the photo has 7 days fuel capacity. It is nearly completed.
- b)     Keith Jackson asked about the type of rock found at that location - Agnes reported that it was hard and needed to be blasted to construct the pump station foundation.
- c)     Rich Virgil described the status of the G-404 and G-409 pump stations. The photograph showed the 3 discharge pipes that will deliver water to the Seminole Reservation. G-404 (570 cfs total capacity, 3@60" pumps) is a concrete structure.
- d)     Jim said that progress has been made on the diversion of stormwater from the lake. The East Shore Water Control District (ESWCD) has bid and awarded its earthwork contract to the Ridgedill construction company. Construction should commence in July. ESWCD will also bid their bridge

construction package in July. Closter Farms is out for bids at this time, with a bid due date of 7/7/99. East Beach Water Control District is still in design, but the pump station plans are virtually complete.

**2) Evaluation of STA 6.**

Ron Bearzotti reported that the permit-required STA 6 annual monitoring report was completed and submitted to the Florida Department of Environmental Protection (FDEP) on April 30, 1999. It describes the results of STA 6 performance from 12/97 through 12/98.

Ron said that the inflow volume into STA 6 was approximately 55,000 acre-feet for the period of December 1997 through November 1998. During this period, the STA removed about 3 metric tons of phosphorus. The average annual flow-weighted mean total phosphorus concentration at the outflow control structure was 19 ppb, although this time period should still be considered a stabilization phase. Pete Rosendahl noted that the basin served by the STA is very defined, and is served by one pump station.

Ron said that total mercury and methyl mercury concentrations in STA 6 inflow and outflow waters never exceeded Class III water quality standards.

Ron handed out and discussed Figures 1 and 2 from the report. Figure 1 shows the flow-weighted Total Phosphorus concentration (TP) in ppb on a monthly breakdown. Figure 2 compares inflow and outflow concentrations for the months of 11/98 and 12/98. Ron said that compliance for non-phosphorus parameters with associated numeric criterion was conducted by comparing the 4-quarter moving outflow average. With the exception of a few quarterly values, all outflow water quality values were either in compliance with numeric criterion or with the inflow versus outflow test. Copies of the Annual Monitoring Report were distributed to those who requested it.

**3) STA 1E Update.**

Jim Sturgis reported on STA 1E progress. The machinery contracts for the inflow pump station (S-319) and the outflow pump station (S-362) were awarded to Ingersoll Dresser (IDP). The capacity under fabrication adds up to 8,000 cfs. The 100% design plans for these stations are due in July 1999, and the Corps hopes to award the work early next year.

The Corps reports that contract(s) for grading will be complete for bidding this fall. Pete Rosendahl asked if the work would be all in one package or if it would be phased. Jim said that land acquisition is not yet complete and may affect parts of the grading work, but apparently there is flexibility in packaging or portioning the work to suit availability of land.

Jim said the geotechnical work is complete and seepage analysis is underway. The Corps is apparently considering hiring a consulting engineer for levee design, and a different consultant for the Period of Record analysis. Burns & McDonnell (B&M) has been contacted for the P.O.R. work, but negotiations have not yet commenced. Galen Miller said it would be a Task Order type of contract with the Corps. Jim said that a Request for Proposals for acquisition of an engineering firm to perform Water Quality modeling was also expected.

Regarding the questions and comments raised on the draft Design Documentation Report (DDR), the Corps is expected to respond formally in July.

Tony asked about the status of project funding. Jim said that it is on a yearly basis and as far as he knows, is on track.

Pete asked if the IDP contract included the seepage pump station, and Jim said it did not. That station will be about 70 cfs, and will also function as the Rustic Ranches stormwater pump.

#### **5) STA 3 / 4 Update.**

Galen Miller said that the evaluation of the STA footprint alternatives, discussed in earlier STA meetings, was nearly complete. The outflow distribution and control results were somewhat surprising, and trying to remain consistent with the deliberations of the Advanced Treatment Technologies Initiative (ATTI), goals of the Restudy and Natural Systems Modeling (NSM) analyses, has set B&M back a few weeks.

Galen said B&M had a good handle on the probable recommendation. The final one will be posted in about 3 weeks.

The recommendation will be for a combined STA, but two alternatives are still being looked at. One would use the line established by the Talisman purchase for a north boundary (Alternative C-2-2), but has the obvious drawback of the timing of land availability (2005). The other is the General Design Memorandum (GDM) footprint, which has more consistent flow path lengths than similar alternatives. Both options exclude the Toe of the Boot.

Galen discussed the six Outflow Distribution Options (seven, if you include the "no STA 3 / 4 option"). Information is now available from Luis Cadavid's analyses of the affects of each option. Also, it is highly probable that the Corps will not turn away from their restriction on sheet flow discharges to northern Water Conservation Area 3A (WCA 3A), of the ECP's interim phosphorus concentration target of 50 ppb.

Mr. Cadavid's analyses have indicated that options that discontinue or reduce the use of pump station S-7 have an impact on the hydroperiods in WCA 2B.

Similarly, some outflow alternatives put too much water in WCA 3A. Option 4 would enlarge the L-5 Canal and send about 1800 cfs west to S-8 (when stages are maxed in the STA) and about 1100 east to S-150 / eastern WCA 3A, and about 2,600 cfs south in sheet flow to WCA 3A. A new pump station may be required to make that happen. Cost differences among the various footprint alternatives are not significant.

Rich Virgil asked if that meant that the STA 5 Outfall Canal would likely be required, and Galen said it would be.

**6. General Discussion / Set next meeting.**

- a. Randy asked that everyone use the webboard for making comments and reviewing the comments of others on the STA 3 / 4 deliverables.
- b. The next meeting will be scheduled for late August.

C: File (w/atts)  
STA list  
New attendees

MtgSTADG.6.30.99